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Profits by Close Material Control

Timing Deliveries to Meet Production Schedules, Based
on Sales Forecasts, Permits Stutz Company to
Turn Over Stock 15 Times Yearly

BY L. A. BARON*

MAINTENANCE of a minimum inventory to secure maximum turnover is the basic principle of the plan for controlling materials which has enabled the Stutz Motor Car Co. of America, Inc., to turn over its stock 15 times annually in the past two years. This is done by timing deliveries of purchased goods to meet current production schedules established as a result of frequent forecasts of sales. In fact, stock has been so controlled that the physical inventory as compared with the book inventory has shown a shrinkage of less than $\frac{1}{2}$ of 1 per cent in value. An account of the factors entering into these accomplishments involves an explanation of the system for regulating stocks.

About 5 per cent of the parts going into direct material costs of the Stutz automobile are fashioned from raw materials in our plant, the remaining 95 per cent coming to

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us as rough, semi-finished or finished parts. Regardless of the state in which material is received it is considered "productive material" from the standpoint of accounting, and therefore no distinction is made on our books. In fact, the designation "productive material" is used for all direct material costs up to the time that shipments are transferred to "cost of sales."

Every piece entering into the Stutz car is either designed or specified by the engineering department. The individual pieces or parts are given both name and number, by which they are identified thereafter. When a new part is designed, a blueprint giving the necessary specifications is furnished the purchasing department for use in ordering the part or the material from which it is to be manufactured. A copy of the blueprint and an "experimental material release notice," Fig. 1, is sent to all other departments concerned. This notice states whether the part is to be manufactured in the plant or is to be purchased and speci-

Incoming Materials Are Promptly Inspected Either In the Receiving Room or On the Assembly Floors. The inspection of valve springs and timing chains is shown



Material Contracts Based on Sales Forecasts

the following year. When this information is released, the purchasing department solicits bids and places contracts for the estimated requirements for the 12 months. The contracts, which cover not only probable production needs, but also spoilage and service requirements, generally do not designate specific quantities of material.

Production materials are ordered from vendors on the purchase order, shown in Fig. 5. This order is made up from a purchase requisition which specifies the shipping date, and gives a complete description of the part, packing instructions, price and terms. A special order form is used for service stores, and another for factory supplies and expense items.

Before the purchase order is released to the vendor, study of the processing time must be made for each part. By process time is meant the vendor's time, plus transpor-

Fig. 1 (upper left)—Experimental Release Notice Issued by Engineering Department
Fig. 2 (upper right)—The Engineering Release Notifies All Departments That the New Part Is to Be Put into Production*
Fig. 4 (lower right)—Changes in Parts in Production Are Made on the Engineering Change Notice

STUTZ MOTOR CAR CO. OF AMERICA INC. 151" W.B. CHASSIS -									
GENERAL DIVISION		151" W.B. Chassis		SUB DIVISION		COOLING SYSTEM		No. V	
CAR No.		To		INCL.		GROUP		REMARKS	
								Purchase	
								SHEET No. 261-2	
								DATE 6-15-28	
STUTZ PART No.		DWG SIZE		NAME OF PART		MATERIAL		NO. REQD.	
								GENERAL REMARKS	
								MAKERS PART No.	
1	24884	B		Radiator Cap		Red Brass - N. P.	1		
2	21468	A		Radiator Cap Gasket		Lead	1	Radiator Cap to Filler Neck	
3									
4	20884	B		Radiator Cap Ornament		Bright Chrom. Plated Finish Die Casting	1		
5	21056	A		Flain Washer - 41/64 I.D.x 1-9/32 O.D.x 1/32 Thick		Brass or Zinc	1	Radiator Cap Ornament to Cap	
6	20837	A		Washer - 5/8 I. D.x 1-1/4 O.D.x 1/32 Thick		Rubberized Fabric	2	Radiator Cap Ornament to Cap	
7	20886	A		Hex. Nut - 5/8-20 Special Crown		Brass	1	Radiator Cap Ornament to Cap	
8									
9									
10									
11									
12	20871	A		Starting Creak Cap		Sheet Alum. Alloy Polished or Steel Stamp.- N.P.	1	Shape into Radiator Shell	
13									
14									
15									
16									
17									
18									
19									
20									
21									
22									
23									
24									
25									

Gen. Div. Bill of Mat. for Series 151" WHEEL BASE CHASSIS - AFTER APPROX.

2500 SERIES HB CARS

THIS SHEET SUPERSEDES SHEET DATED

THIS SHEET IS SUPERSEDED BY SHEET DATED

Fig. 3—Bill of Materials. Upon completion of experimental work, the new part, if approved by the chief engineer, is released for production. At the same time, all necessary data are written into the bill of materials

tation time, plus our time. Thus, when the purchasing department contracts for the purchase of a part, it obtains the vendor's process and shipping time. Moreover, when the engineering department releases a part for production, the material supervisor informs the purchasing department as to the factory process time, which varies from 48 hr. on local pick-up items to 90 days on such parts as bodies and crankshafts. When production is being maintained on schedule, bodies and crankshafts for cars coming off the assembly line today should have been received not less than 20 days previously.

Five copies are made of the purchase order, one of which is sent to the vendor, one to the cost department and one to the receiving department, while two are retained by the purchasing department.

Materials and Supplies Controlled by Material Supervisor

As soon as material enters the plant it passes under the control of the material supervisor, who has charge of all "productive material" and factory supplies within the plant. The receiving room, interior trucking, stock chasers' material records and many other activities are under his supervision. About 90 per cent of the parts received are unpacked and counted in the receiving room, the remaining 10 per cent, constituting bulky materials such as cushion springs, fenders, bodies and frames, being delivered directly to the first station along the production line.

The receiving department makes out the report shown in Fig. 6 for every lot of material delivered to the plant. Six copies are prepared. The first is attached to the vendor's invoice and forwarded to the accounting department, while the second is used by the purchasing department to complete its record of the purchase order. The third is re-

tained in the receiving department, and the fourth is sent to the material supervisor to complete the material record. The fifth and sixth are sent with the material to the receiving inspection room, the former being kept by the inspection department and the latter going to the point on the assembly line where the material is to be used.

Incoming Material Inspected

All materials are inspected in the receiving inspection room or on the assembly floors as rapidly as delivered. While in the process of inspection the materials are temporarily out of the jurisdiction of the material supervisor and are under control of the chief inspector, who is responsible directly to the president of the company.

Parts that do not pass the receiving inspection are covered by the "defective material receiving inspection report," shown in Fig. 7, which, in addition to a complete description of the material, records the vendor's name, purchase order number and the reasons for rejection. In case the supplier has failed to comply with our specifications, the report is stamped "return to vendor for replacement." A similar report is used for parts having defects that are found later in the course of production and for which the vendor is responsible. The only difference between the two reports is that the latter states the department in which the material was found and how far it had progressed along the line toward completion.

Both reports are filled out in triplicate, one copy being sent to the material supervisor for his records, the second to the purchasing department for use in making replacement purchase requisitions and in preparing shipping instructions for the return to vendor; and the third is retained by the inspection department. The purchasing department makes out a shipping order, and the vendor is

PURCHASE ORDER
Stutz Motor Car Co. of America, Inc.
INDIANAPOLIS, INDIANA

PURCHASE DEPT. FILE COPY
DATE _____ P. O. NO. _____ TERMS _____

SHIP VIA _____ MESSERS _____

DESCRIPTION OF MATERIAL WANTED _____

QUANTITY _____

SHIPPING SPECIFICATIONS
SHIP ON DATE SHIPPED—NOT BEFORE _____

Part No. _____
Part Name _____
Series _____
Stores _____
Acct. No. _____
Price _____

RECEIVING REPORT
STUTZ MOTOR CAR CO. OF AMERICA, INC.
R. R. No. 86551

RECEIVED FROM _____ DATE OF RECEIPT _____
ADDRESS _____
FORM NO. 148
VIA _____

P. O. No.	QUANTITY	WEIGHT	PART NO.	DESCRIPTION	INSPECTION O. K.	REJECTED	RECEIVED IN STORE
1							

BOOKS _____ CRATES _____ COUNTED BY _____ INSPECTED BY _____
BARRELS _____ PACKAGES _____ CHECKED BY _____ INSPECTED BY _____
BAGS _____ BUNDLES _____ RECORDED BY _____ INSPECTED BY _____

This Copy to be delivered to Purchasing Dept. for attaching to Invoice.

Fig. 5 (at left)—Purchase Order for Production Materials

Fig. 6 (at right)—Receiving Report, Used for Every Lot of Material Delivered to the Plant. Six copies are made

charged for the defective material on a debit memorandum. The record then is credited to the production material inventory account, and the purchasing department issues a purchase order to cover replacement of the defective material, the amount of stock thus being kept at the predetermined level.

Parts that have been passed by the receiving inspection department again come under the jurisdiction of the material supervisor, although there is no formal transfer. Instead a system of locations is used as a means of designating that a quantity of material has passed inspection. Material is delivered by the stores department to more than 200 stations along the assembly line.

While we do not have storerooms which are designated by that term, we do have four cribs in which are stored perishable material such as trim, special fittings, paints, etc. Only parts that are particularly subject to pilfering, such as clocks, speedometer heads, trouble lamps and cigar lighters, are kept under lock and key. For the storage of items that go on the instrument boards there is a special combination storage and assembly room, the instruments leaving this room assembled to the board, ready to be fitted into the body of the car. In this way theft of these parts is held to a minimum.

As the majority of parts of the Stutz automobile are not interchangeable with those of other cars, we have little trouble with theft. Incidentally, this phase of material control is so common to all car manufacturers that long ago it was found cheaper to put the bulk of materials in an open, accessible place near the assembly line than to keep them in storerooms where requisitions are necessary to cover withdrawals.

Damaged, broken and scrapped parts are accounted for daily. These are passed upon by the floor inspector and sent to the salvage department. If the part can be repaired in the plant, the salvage or some other department makes the repair and charges the labor to the department responsible for the damage. If the part cannot be repaired, it is covered by a "defective material in process" report, which is similar in form to the "defective material receiving inspection—vendor responsible" report, Fig. 7, and is shown just above that report. Copies are sent to the purchasing department, cost department and material supervisor. The report describes the part and the extent of defect or damage and names the department responsible. The face of the report is stamped with suitable wording to cover each case, such as "consigned to scrap bin" for parts which are a complete loss, or "return for repairs at our expense" for parts to be repaired outside the plant, or "deliver to obsolete stores" for parts which are discontinued when engineering changes are made. The purchasing department uses its copy of the report to make out the repair purchase order or to cover replacement, while the material supervisor completes the material stock records and the cost department charges the department responsible with the loss, and credits the productive material inventory.

Although all materials in process are under the jurisdiction of the material supervisor, the inspection department has authority to reject any piece found anywhere in the plant that does not meet requirements. Such pieces, with a defective material tag, are sent to the salvage department, which examines them to determine the extent of the defect, and then fills out the necessary "defective material reports."

As a further means of controlling material, one person in each department is designated to watch the stock. He may be a member of the stock department or an assistant foreman. On every part a minimum quantity is set to comply with production schedules and when the supply approaches the minimum, a report is made to the material supervisor. The reports, made by each department, are compiled each morning into a "dangerous shortage report." This shortage list is checked against unfilled purchase orders and steps are taken to expedite deliveries or to place orders to cover the shortage.

When the material supervisor checks his records against the "dangerous shortage report" he ascertains the reason for the shortage. If the shortage cannot be reconciled with the stock records, he issues an "unaccountable loss" report, or "productive material loss" report, Fig. 8, in duplicate and corrects his records to conform to the actual count. One copy of this report, which shows the quantity lost and the department responsible, is sent to the purchasing department

for a "shortage purchase order" and the other is forwarded to the cost department for charges against the department responsible and credit to inventory.

How the Inventory Is Maintained

An inventory of cars in process and of finished cars is kept both by the sales order department and the material supervisor. While we try to build the cars to predetermined production schedules, in reality our operations are usually governed by the number of bodies received. The inventory is maintained in the following manner. When a sales order is received, the order department checks over the inventory to ascertain what cars are in process and what are completed, ready for shipment. If no cars are available, a sales shipping order is made out and a copy dispatched to the material supervisor. As soon as a suitable body is received, the order is released for production. When bodies arrive for which there is no shipping order, the material super-

STUTZ MOTOR CAR CO. OF AMERICA, INC.
FORM NO. 184
DEFECTIVE MATERIAL—IN PROCESS
DEPARTMENT RESPONSIBLE

DATE
PART NO.
ORIGINAL—MATERIAL CONTROL DEPT
PART NAME
QUANTITY
FROM DEPT.
DESIGNATE
REPAIRABLE? YES OR NO
NATURE OF DEFECT AND REPAIRS NECESSARY:
LAST ORDER NO.
THIS SPACE FOR MATERIAL CONTROL DEPT.
SHIP'S ORDER NO.
DATE SHIPPED
SHIPPED VIA

STUTZ MOTOR CAR CO. OF AMERICA, INC.
FORM NO. 185
DEFECTIVE MATERIAL—RECEIVING INSPECTION
VENDOR RESPONSIBLE

DATE
PART NO.
ORIGINAL—MATERIAL CONTROL DEPT.
PART NAME
VENDOR
REC'D FROM
ON REC. REPT. NO.
P.O. NO.
QUANTITY RECEIVED
QUANTITY REJECTED
DESIGNATE
REPAIRABLE? YES OR NO
NATURE OF DEFECTS AND REPAIRS NECESSARY
THIS SPACE FOR MATERIAL CONTROL DEPT.
SHIP'S ORDER NO.
DATE SHIPPED
SHIPPED VIA
P.O. NO.
COST PER
WEIGHT
VENDOR
CHANGE REPAIRS TO
ESTIMATED COST OF REPAIRS
DEPT. MTL. TAG NO.
INSPECTOR

Form 326
Stutz Motor Car Co. of America, Inc.
PRODUCTIVE MATERIAL LOSS REPORT

ORIGINAL
Part Name or Description
Date
Part No.
Total Quantity on Hand as of Inventory Date
Total Received since Inventory
Total Debit
Requirements on Shipments since Inv.
Scrap Losses Reported " "
Service Withdrawals " "
Total Credit
Net Pieces to Account for
Actual Count on Hand Today
Quantity Short
Cost Department is authorized to charge the value of the above shortage as an expense against Dept. No.
Supervisor of Materials
Supervisor of materials will report all losses of Productive Materials on this form. Duplicate will be forwarded to the Cost Dept.

Fig. 7 (lower right)—The Defective Material Vendor Responsible Report Is Issued for All Parts that Fail to Pass Receiving Inspection. A similar report is made for parts found defective in production and for which the vendor is responsible

The report at the upper left is used for accounting for and replacing damaged parts for which the production departments are responsible

Fig. 8 (lower left)—Productive Material Loss Report Used by the Material Supervisor

visor notifies the sales order department which issues a stock order.

The sales order department and the material supervisor keep records of the bodies received and in process, the records being divided into the various body types. Data given include the paint and trim specifications for each body in process, which is necessary to comply with our sales policy of "no two cars alike," the date that the body passed through the paint and trim department, when it was mounted on the chassis, when the car assembly was completed, when the car passed the final test, the date of shipment and the shipping order number. This record, which is completed daily, is the only inventory of finished products which we carry; it enables the management to tell when any sales order can be filled. Incidentally, for accounting and cost purposes, all cars are in process until they leave the plant for delivery to customers.

Control and purchase of materials for service stores and of factory supplies are handled in the same manner as for productive materials. Service stores is charged with the value of all purchases for its account and is credited with the cost of service parts sales, while supply stores is charged with the value of supply purchases and is credited through the medium of all requisitions covering withdrawals.

It is always necessary for service stores to draw on production for current productive items, such cases being accounted for by means of requisitions whereby productive material stores is properly credited and service stores debited. The material supervisor keeps his material records up to date from these requisitions before they are passed to the cost department for costing and for transfer of charges.

Material Records Compiled from Receiving and Other Reports

The material supervisor compiles his material records from the "receiving reports" covering receipt of goods, "defective material reports" for vendor defects and departmental spoilage, "unaccountable loss reports" for other losses and pilferage, and requisitions for withdrawals by the

service department. To ascertain the amount of any given part on hand at any time he figures as follows: Quantity at last physical inventory, plus receipts, and minus returns, the result being the net total debit; scrap, plus service withdrawals, plus requirements on cars produced, gives the total credit; net debit, minus total credit, gives the quantity on hand.

All goods entering the plant are covered by a receiving report, a copy of which is matched by the vendor's invoice and is forwarded to the accounting department. The matching of the receiving reports and the vendor's invoice is done by the purchasing department after it has checked invoices for price, terms and quantity. Every purchase order shows to what account the purchase is to be charged, this information also being written into the receiving report in the receiving department, which obtains the information from its copy of the purchase order. When the accounting department gets the invoices with the receiving reports, it analyzes the purchases on cards. These tabulated data make up the "contra account" for the accounts payable journal.

Car Sales Analyzed Monthly

Analysis of productive material is made in detail and shows the part number, quantity, price of each and the total amount. This information is posted in the material cost records, which are made up in the form of a ledger with separate sheets for each part shown in the bill of materials. Each sheet carries all of the information given in the bill of materials for each part, such as the usage per type of car and the place where the part is used on the car. These parts vary in price from 0.0001 cents for many small items, to \$1,800 for custom built bodies.

Each month the cost department analyzes car sales, separating the cars into different groups. The material cost of each group shipped is compiled, using data contained in the bill of materials and in the material cost records. The total cost is computed by adding up the material costs of the groups. Cost of car sales is then debited and productive material inventory credited.

Aging of Cold-Drawn Metals

In the experimental work described by Dr. L. B. Pfeil, University College, Swansea, in a paper read before the (British) Iron and Steel Institute at the meeting in September at Bilbao, Spain, the tensile test was employed as a measure of the capacity of the metal to undergo age-hardening after cold-drawing, and it is shown that the phenomenon is chiefly due to the presence of carbon. Carbon-free iron is not subject to aging, but iron containing as little as 0.0025 per cent of carbon shows well-developed aging. Iron containing ferrous oxide also exhibits the phenomenon. It is suggested that both carbon and iron oxide are soluble to a small extent in ferrite at ordinary temperatures, but that the solubility is less in distorted crystals, with the result that hardening and strengthening of the duralumin type occurs after cold-working.

Standard Skid Platforms

In order to further the method of shipping goods to ultimate destination on skid platforms, the Division of Simplified Practice of the Bureau of Standards has recommended that the clearance heights be fixed at 8 or 12 in. and the minimum clearance between supports be 29 in. It is estimated that \$700,000 is expended annually in loading and unloading goods which can be shipped on skid plat-

forms, and of this cost approximately one-half would be saved by so doing. This practice facilitates handling all along the line of movement from factory to consumer. Goods thus prepared for shipment are loaded into cars, unloaded onto trucks, and finally moved into the customer's stock rooms without breaking bulk, with a minimum of physical effort, and with a great saving in time.

Short Drop Lessens Segregation in Blast Furnace Burden

To study the changes taking place in porosity of the blast furnace burden, and by that means to get more light on the chemical reactions of iron smelting, the Minneapolis station of the United States Bureau of Mines has been experimenting with scale models one and three feet in diameter. Similar tests have checked quantitatively. Results to date show that, with an equivalent big bell clearance of 2 ft., greater proportions of ore to coke are deposited around the periphery. Coke is also found to have a smaller angle of repose than ore, while larger pieces of ore tend to roll to the center of the furnace. Size segregation may be reduced by depositing material on the stock line as rapidly as possible. This may be accomplished by increasing the bell drop and the angle of the bell, and by decreasing the distance from the stock line to bottom of the bell.

Mass Production of Bolts and Nuts

Manufacture of 3000 Standard Sizes and Types, in Addition to Special Requirements, Calls for Varied and Ingenious Methods and Machines

BY GEORGE A. RICHARDSON*

MODERN demands for mass production, whenever possible and economical, have resulted in the development of distinctive and ingenious methods and equipment for large-scale manufacture of bolts, nuts and related products at the Lebanon, Pa., plant of the Bethlehem Steel Co., where 3000 sizes and types of bolts and nuts are regularly made and carried in stock, not including the much larger variety called for on special specifications.

Plant production sheets show that a minimum of eight and a maximum of 16 to 20 distinct operations are involved in completing a single item, the number depending on the type and degree of finish called for. Each operation requires the use of special machines of various sizes, ranges and capacities.

There are two standards for the manufacture of nuts in common use in this country:

1. *The Shop or Manufacturer's Standard.* Nuts conforming to this are those placed on bolts regularly carried in stock and sold off the shelf. These are sometimes known as bin nuts, a later name which comes from the fact that the nuts are carried in stock in bins. When nuts alone are ordered the United States Standard is usually furnished.

*Bethlehem Steel Co., Bethlehem, Pa.

2. *United States Standard.* Nuts conforming to this standard are slightly larger in dimensions than Shop Standard nuts. Ultimately, both of these standards will be done away with in favor of one sponsored by the Government and various societies. In fact, the movement to effect this simplification is making rapid headway, and shortly the Shop or Manufacturers' Standard will be a thing of the past. Owing to conditions that have to be met, it will take longer to discard the United States Standard entirely.

Nuts are also made hot or cold. In general, all nuts $\frac{1}{2}$ in. and smaller in size are made cold, while those $\frac{3}{4}$ in. and larger are made hot. The exception to this is in the case of $\frac{1}{2}$ in. United States Standard nuts, which may be either hot or cold.

United States Standard nuts are made in different styles and types as follows:

1. Hot pressed, blank and tapped.
2. Cold punched (c. and t.), chamfered and trimmed, blank and tapped.
3. Cold punched (c.p.c. and t.), semi-finished.
4. Bethlehem treated nuts, United States dimensions, specially treated.
5. Standard unit lock nut, United States dimensions, made in same types as above.



Each Hot Nut Machine Is Provided with a Heating Furnace

In addition, Bethlehem makes certain special nuts, including the following:

1. *Ideal Recessed Nut.* This is distinctly a track bolt nut and usually made to special dimensions. It is thicker and of special shape.

2. *Tail Nuts.* Used chiefly on heel bolts on plowshares, etc. So called because of a projecting tail which enables the farmer to turn them up tight by hitting with a stone or hammer.

Bolts are also made to conform to the two standards, although about 1 per cent is made with the United States head in either square or hexagon. Here, too, a movement is on foot to eliminate the two old in favor of the new American standard. Both cold and hot processes are used, the size limit being practically the same as for nuts. In other words, bolts $\frac{1}{2}$ in. diameter x 6 in. long and smaller are made cold. The larger sizes are made hot. All types of bolts are made, including square and hexagon head, carriage, plow, etc.

The problems of a bolt and nut manufacturing plant are complicated by the infinite variety of sizes and types. A further source of complication lies in the big variations in the quantities called for. This condition has a very important bearing on the types of equipment that can be advantageously used and divides the products into two more groupings.

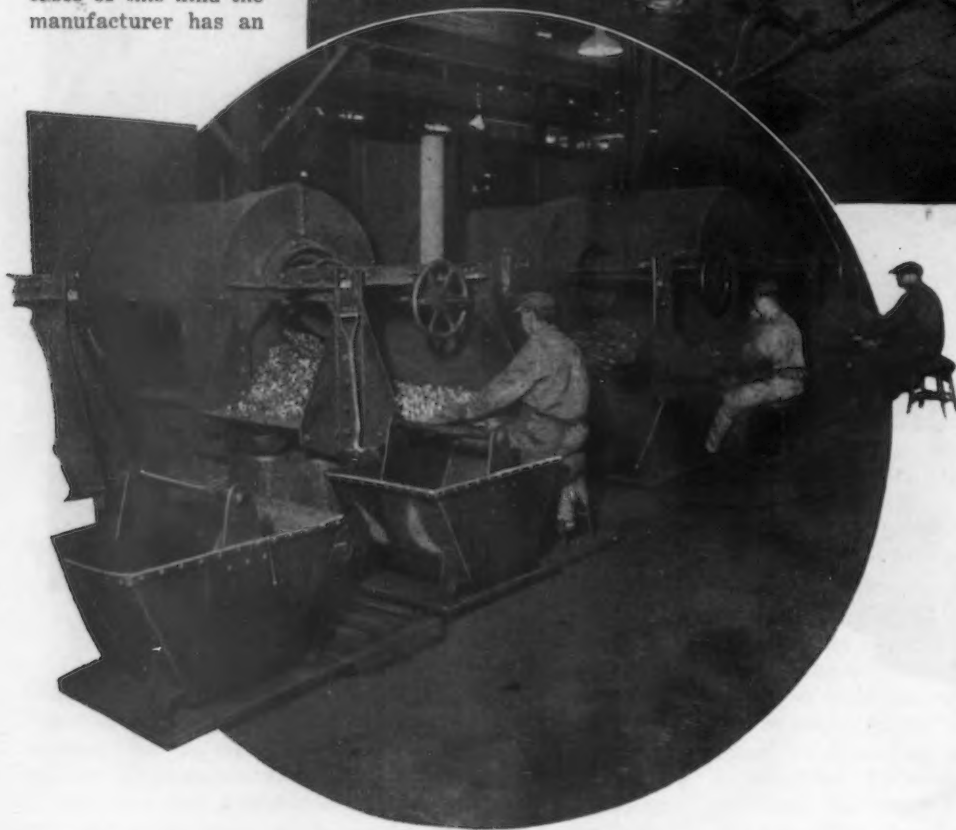
On the one hand are certain products ordered or used in large quantities. In cases of this kind the manufacturer has an

opportunity to utilize the very latest types of automatic machines designed for large-scale mass production.

On the other hand, a large proportion of the products are either of a special nature, or ordered in quantities which do not justify the expense of designing and installing special machinery. In this case, equipment of the more ordinary types must be used, and instead of the highly ingenious automatic machines, semi-automatic and even hand-operated machines are the most economical. This explains why mass production has not been so much employed in some departments as in others.

Both Wrought Iron and Steel Used

Wrought iron and steel are both used in making the finished products. The wrought iron is made direct from pig iron in the puddling department of the Lebanon plant. It is used for the manufacture of boiler staybolts, engine



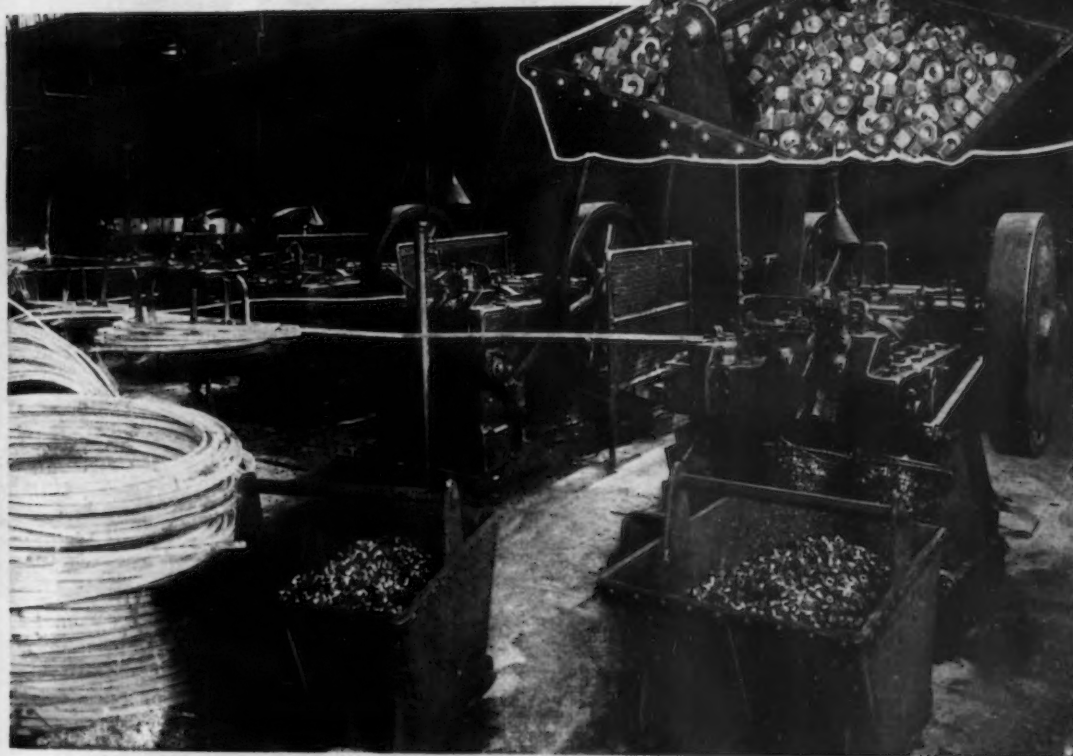
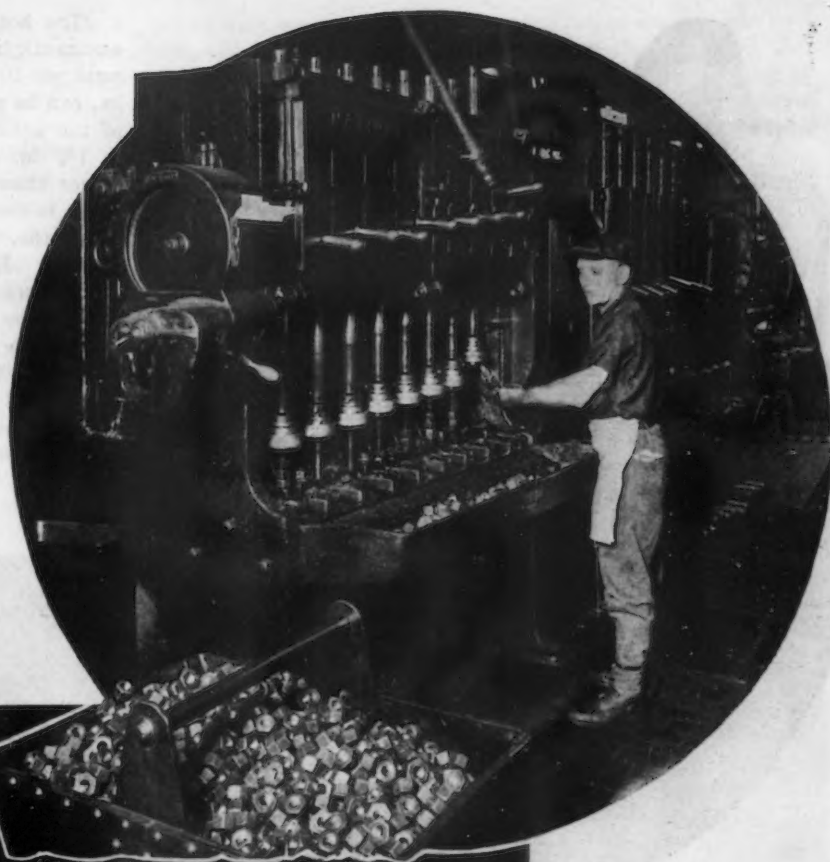
An Electrically Operated Skip Hoist Dumps the Nuts on a Riddler, Shown in Upper Picture, Which by a Jig Motion Separates the Scrap from the Nuts. Tumbling to knock off scale and sharp corners is the next operation. Lower picture shows tumbling machines and inspectors separating bad from good nuts

bolts, etc., and is handled separately. All steel materials are brought in in the form of billets, coils, flats, rounds and wire from other units of the Bethlehem organization.

Commercial bolts, nuts and related products are made from steel, the form of which depends to a large extent on the size of the finished product. In other words, for the larger bolts and nuts which are made hot, bar stock is used, whereas the smaller sizes are made cold from coils of cold-drawn sections or wire.

Large quantities of bar stock in standard sections are used, and a new 10-in. bar mill has recently been put into operation to insure a uniform source of supply. At present, more than 70 per cent of the total requirements of the plant are rolled on this mill. Odd lots and special sizes are rolled on the older type hand mills.

The 10-in. mill is located in a separate building, together with auxiliary equipment. It is of the looping type, assuring the latest and best practice. The general procedure at



Semi-automatic Tappers, Shown Above, Are Used to Tap the Larger Sizes of Nuts, While Smaller Sizes Are Tapped on Automatic Machines. The operations of the cold nut machines (below) follow a sequence similar to that of the hot nut department

this mill is as follows: Steel standard billets 4 in. x 4 in. x 30 ft. long, made in other Bethlehem plants and stocked in a special billet yard, are transferred by crane and charged by electric machine into the upper end of a gas-fired, 72-ton capacity, continuous heating furnace. The billets are gradually moved from the upper end of the furnace to the discharge point, and, as they travel, are brought up to the proper rolling temperature, in 2 to 4 hr., the time depending upon the size of the finished bars. Small sizes takes longer to roll, and more heating time is required. A mechanically-operated pusher pushes the heated billets out of the furnace on to a roller conveyor and thence to the first stand of rolls in the 16-in. continuous mill. Interposed in the conveyor are shears which cut up the billets into mill lengths.

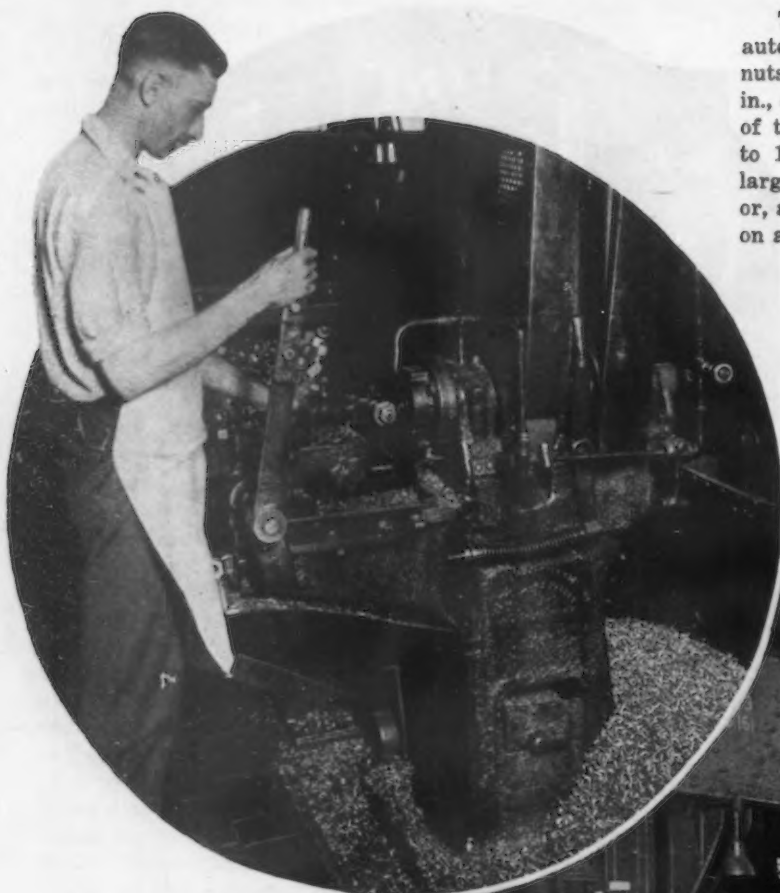
The rolling equipment consists of a six-stand 16-in. continuous mill, two 14-in. pony roughing stands, two 12-in. strand rolls and two 10-in. strand rolls. Either or both sets

of strand rolls are used, according to the finished size of bar.

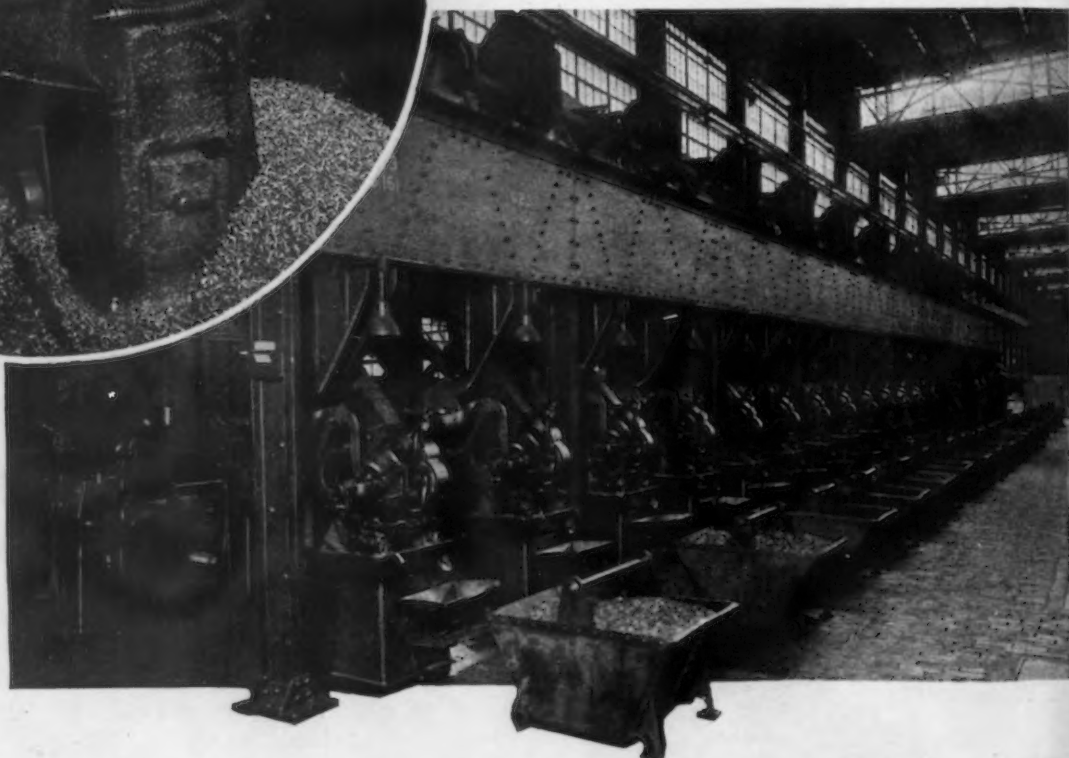
Bars Cut and Inspected for Size

On leaving the finishing rolls, the bars pass to the hot bed and on the way are cut by automatic rotary flying shears into 150-ft. lengths. Squares, rounds and flats are rolled on this mill, the range of sizes for squares and rounds being $31/64$ in. to $1\frac{1}{4}$ in. diameter. For flats, the size limits are $1\frac{1}{64}$ in. to $2\frac{1}{2}$ in. wide x $\frac{5}{8}$ to $1\frac{1}{2}$ in. thick.

On the hot bed, the bars are inspected for size. As they cool, they are moved over from one side to the other by an arrangement of rockers. There they drop on to a conveyor, which carries them to a set of hand-controlled shears, where they are cut up into 30-ft. lengths. These are inspected, bundled and the bundles tagged with metal tags, showing the size, heat number and other information. The bundles are then transferred to a large storage building immediate-



Facing Practice with New Hand Fed Machines (Above) Is to Run the Nuts on to a Threaded Mandrel, Thus Obtaining an Accurate Face Which Sets Level. Nuts $\frac{5}{8}$ in. and smaller are tapped on automatic machines (below), while larger sizes are taken care of on hand fed or semi-automatic machines



The hot nut shop is equipped with both hand fed and automatic machines, and has a capacity of 150,000 lb. of nuts per 10-hr. day. Square or hexagon nuts, $\frac{5}{8}$ in. to $3\frac{1}{2}$ in., can be made on the hand fed machines. The size range of the automatic machines is not so great, extending only to $1\frac{1}{2}$ in. square or hexagon, in either standard. Sizes larger than $3\frac{1}{2}$ in. are made either on forging machines, or, as is the modern practice to a limited extent, from bars on a lathe.

Each hot nut machine is provided with a heating furnace. Pulverized coal, reduced to proper fineness in a central plant, is used as a fuel, and gives very satisfactory results, because close control of the feed is readily obtained. An overhead screw feed brings the coal to hoppers located over each furnace and from here it is fed with the aid of two screws and an air blast. In one or two cases the coal is sucked out of the hopper by vacuum.

ly adjacent and kept until needed for use in the factory department.

Operations for Finishing the Products

This brief description of the rolling facilities and sources of supply of materials brings us to the operations involved in the manufacture of the finished product. With the exception of track bolts, rivets, screw spikes, and certain types of bolts, all preliminary operations are performed in units comprising parts of the older division of the plant. The most important preliminary operation is that of forming the material, i.e., bolt stock is cut to length and headed, blanks for nuts cut and punched, etc. All finishing operations are performed in the finishing department to which the semi-finished products are transferred.

The five departments in the old division of the plant which do the actual working up of the material are: Hot nut department, cold nut department, hot bolt department, cold bolt department and No. 3 threading department.

Hot Nut Shop Makes 150,000 Lb. Per Day

As already mentioned, all nuts from $\frac{5}{8}$ in. upward are made hot. In addition, United States nuts in the $\frac{1}{2}$ -in. size may be made hot.

In making nuts, flat bar stock is used, the length running from 8 to 9 ft. in the case of a hand fed or center feed type machine. To give some idea of the size of bars required two typical examples are mentioned below:

For bolts $\frac{3}{4}$ in. diameter, the United States size of the nuts will be $11/16$ in. x $\frac{3}{4}$ in. x $5/16$ in. thick, calling for a flat $21/32$ in. x $25/64$ in. Normally, bin nuts or Manufacturers' Standard would be supplied on bolts of this size, and in that case the dimensions would be somewhat smaller.

For a $3\frac{1}{2}$ -in. diameter bolt, a United States nut would always be furnished, the dimensions being $5\frac{3}{8}$ in. x $3\frac{1}{2}$ x $3\frac{3}{32}$ in. thick, for which a flat 5 in. x $3\frac{15}{16}$ in. is the proper size.

These examples represent the standard practice for square and hexagon nuts.

Bars of the proper size are placed in the heating furnace and about three feet of one end brought to forging temperature. After this amount is worked up the bar is replaced in the furnace and another section is heated. As a result of this practice, it is customary to start charging at one side of the furnace and continue until there is a full charge, 40 to 45 bars, across the entire front. When the first bar has come up to temperature it is removed and the practice from then on is to "cut across"; in other words,

as soon as one bar has been cut at the end it goes back to its same position in the furnace for reheating. In this way the nut maker goes back and forth until it is time to start all over again with a new charge.

Making Rough Blank Requires Four Operations

Four operations are required in the machine to form a rough blank, these being in sequence as follows:

1. As end of heated bar is placed in machine a piece of the proper length is cut off and shoved in the die. The die is stationary and fastened in the die block. The moving parts are the punch, piercer and crowner.

2. The piece is pierced and crowned.

3. The crowner comes forward still further and ejects the nut.

4. A "picker" comes down, knocks the blank nut off the crowner, and on to a flight conveyor, which carries it to a container holding about 3000 lb. When full, the container is transferred by electric truck to temporary storage and weighed.

In the majority of machines, the scrap in the shape of trimmings and punchings goes into the containers with the blanks and is separated later as described below. A few of the machines, however, used for square nuts only, from $\frac{3}{8}$ in. to $\frac{5}{8}$ in., separate the scrap at the machine and not only eliminate the necessity of riddling but finish the blanks in such a manner that burring is not required.

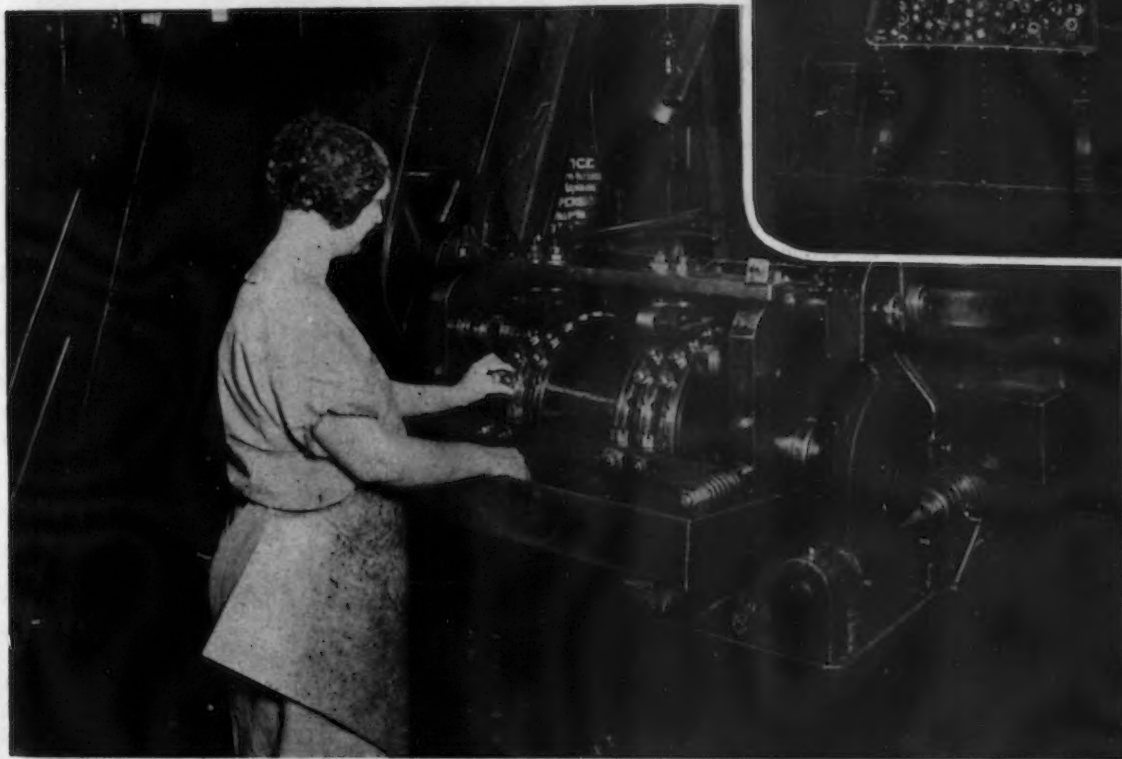
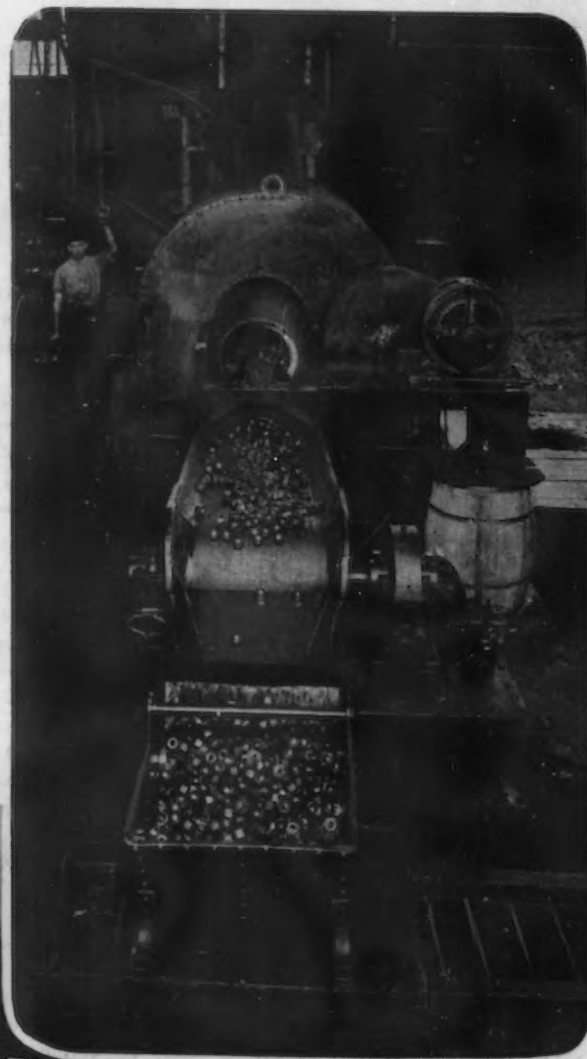
Storage battery trucks carry the containers in temporary storage to an electrically operated skip hoist, into which the contents are dumped, lifted, and poured down on to the screen of the riddler. This is a machine of the jig type, the screen being rapidly moved back and forth. The scrap drops through the screen into a small car and is ultimately disposed of for remelting purposes. The blank nuts slide down into another container and are ready for the next operation, known as "burring."

The burr formed at the point of punching must be removed by machine. Semi-automatic, two-spindle burring machines, which burr two nuts at one time, are used. The blank nuts are set by hand in dies or jigs, mounted on a flat revolving turret. As this turret rotates, it stops at points so located that two blanks come under the two spindles, each provided with three high-speed steel cutters. These descend and cut the burr off. At the same time, the

two nuts burred in the previous operation are brought over openings through which punches push them so that they drop into a container. The two operations of trimming off the burr and pushing the nuts out of the dies are performed simultaneously, while a fresh supply of nuts is being placed in the empty jigs; hence, there is very little wasted time. The consideration of safety has not been overlooked and a treadle release brings the machine to a stop in case of necessity.

Scale Knocked Off by Tumbling

Tumbling to knock off scale and sharp corners is the next operation. The nuts are carried to the tumblers, long motor-driven cylinders, in containers holding about 1400 lb.



All nuts, with the Exception of Track Bolt Nuts, Are Cleaned in a Hot Chemical Solution Which Cuts the Oil. The upper picture shows the "washing" machine. A machine for castellating nuts (below) consists of a revolving drum containing four grooves in which jigs or chucks are mounted.

each. After tumbling, the nuts pass directly out at the far end on to a sorting table, where there is a thorough inspection and sorting. There has already been a partial inspection at the burring machines, where operators throw out any half nuts. Inspectors spread out the nuts, turn them over and eliminate those with cracks, unclear burring, poorly formed blanks, and any other imperfections. These men become very expert.

The nuts are again dumped into containers and transferred to the loading station, thence in turn they are delivered to the finishing department.

A few automatic hot nut machines are in use, and for these 30-ft. bars are furnished. The latter are transferred from the storage building on racks, the sides of which drop, forming a table for the approach of the bars to the oil-fired furnaces. The bars are fed into the furnaces by hand and pushed out into the pinch rolls of the hot-nut machines.

With the exception of the automatic features, the operation of these machines is similar to that of the hand fed machines. There is one slight change in practice. In the case of the hand fed machines, the bars are rotated at each cutting-off position to offset the bending action at the die. This rotation is not necessary in the automatic machines, because their greater bearing surface offsets the bending action.

A few production figures help to visualize the amount of work that can be done. One hundred 1-in. hexagon nuts weigh 56.14 lb. About 6000 lb. of these can be made in a day's run on a hand fed machine and the capacity is increased to about 8000 lb. in the case of square nuts. The scrap loss is necessarily quite large, as it includes the punchings as well as the portions trimmed off. For hexagon nuts, the average amount of material scrapped is 50 per cent. This is lowered to about 32 per cent in the case of square nuts.

Operations in the Cold Nut Department

The number of operations involved in producing blanks in the cold nut department is considerably reduced by reason of the fact that when they leave the machine they are ready for transfer direct to the finishing department without riddling, burring, etc.

The stock comes in coils in usual weights of 200, 250 or 275 lb. each. Bin nuts from 3/16 in. up to and including 1/2 in. square and all United States sizes, including 9/16 in. hexagon and square, can be made on these machines, which produce from 60 to 80 nuts per min. per machine, according to the size.

The operations of the cold nut machines follow a sequence similar to that of the hot machines. The stock entering the machine is cut off, formed with a forming punch and punched, after which the blanks go to the finishing dies. Tumbling, sorting and inspecting follow and the nuts are then ready for transfer to the finishing department.

The finishing department, where all the various finishing operations on bolts and nuts are performed, is an interesting section of the Lebanon plant. Here, in addition to the more commonplace types of machines, are automatic machines designed for mass production on a large scale. This department is housed in half of a large steel and brick building, which is about 375 ft. wide by 1150 ft. long. The other half is used as a warehouse.

The exact point at which material enters the finishing departments depends upon the amount and kind of finishing specified. Nuts classified as "rough" go direct to the tapping department, tapping being the only operation before inspection and washing. Semi-finished, on the other hand, require a number of additional operations and enter at the west end of the building. Semi-finished nuts are chamfered and trimmed and faced on the bottom. Finished nuts are made from cold-drawn steel on an automatic lathe.

The general order of work in the case of semi-finished nuts runs somewhat as follows: Flatten, chamfer, trim,

tap, face, castellate if required, wash and inspect. (Both semi-finished and finished nuts may be castellated.)

The various operations and machines are grouped in bays, of which there are three. All nuts are finished in the north bay; large bolts in the middle bay, and all 1/2 in. and smaller bolts are handled in the south bay.

The more important operations in their logical sequence without regard to individual specifications are as follows:

Flattening.—Although a commonly used term, "pressing" really better describes this first operation, which is for the purpose of obtaining a more uniform thickness and making the nuts more level. It is a preliminary operation for chamfering and is done in semi-automatic, hand fed presses.

Chamfering.—Chamfering is the operation of beveling the corners of the nuts. Equipment of the general description mentioned above is used, modifications being made according to the nature of the work involved.

Trimming.—The number of trimming operations depends on: (a) The size of the nut; 1 1/4 to 1 3/4-in. nuts are trimmed five times; 1/2 to 3/4-in. are trimmed three times; (b) the quality of the stock and the tolerance allowed for irregularities.

Inspection.—A thorough inspection is made here for both surface and general imperfections. This is only one of numerous inspections. There is an inspection at each individual operation.

Tapping.—One of the most interesting parts of the nut section of the finishing department is the division where tapping is done. Nuts 7/8 in. and smaller are tapped on automatic machines, while the larger sizes are taken care of on hand fed or semi-automatic machines. The semi-automatic tapping machines, depending upon the individual design, are fed by hand, either directly to the tap, or into a slot leading to the tap. The taps are automatically raised and lowered and as they come down tap the nuts which have been pushed into position. These nuts remain on the taps until the taps are filled. The taps, which fill in rotation, are lifted out, one at a time, while the machine is operating and the nuts are stripped off by hand. The taps are then reset in the machines. One group of 39 automatic machines is used for the smaller nuts; these machines are capable of tapping from 1,000,000 to 1,500,000 per day. Operations are as follows:

The nuts to be tapped are delivered in containers holding from 1000 to 2000 lb. each. These are dumped by crane into stock bins at the top of the machine. The nuts feed down from these bins by gravity into an open hopper. A circular disk, in the periphery of which are small lugs, rotates in the hopper. The lugs lift or pick up the nuts and push them into a narrow chute or track, down which they slide, one at a time, to a pusher or finger which, moving in and out, pushes the nuts on to the tap.

The tap used is bent, and thus differs from the ordinary. It is mounted in a revolving head and rotates with the head. The nuts, either square or hexagon, instead of being removed after tapping from the tap end, pass off over the shank and drop down into the inspection pan.

Inspectors watch for imperfect tapping. When there is evidence of this, the machine is stopped and steps taken to correct the cause of the trouble. Small pans are used so that if a defect develops only a few nuts instead of several thousand need to be sorted.

With machines of this character 19 1/4-in. nuts and 21 1/2-in. nuts are tapped per min. The greater tapping speed of the larger nut is due to its coarser thread.

In some cases, nuts, after tapping, go direct to nearby sorting benches, where they are inspected and sorted. Other operations may follow, first, however, as indicated below:

Facing.—Facing, when required, is done on special machines. In the facing operation, the cutter puts on a washer effect. The older practice of facing was simply to chuck nuts and run the cutter over them, with the result that a

good bearing surface was seldom obtained. Facing practice with new hand fed machines is to run the nuts on to a threaded mandrel, thus obtaining an accurate face which sets level. Nuts from $\frac{3}{4}$ in. to 2 in. can be handled on these machines and the facing made to an accuracy of 0.002 in.

Castellating.—Nuts are castellated to meet A. S. M. E. specifications. The new machines used are comparatively simple but effective in their operation. A rotating drum contains four grooves in which jigs or chucks of the size and shape necessary are mounted. The nuts are placed in these and as the drum rotates pass under milling cutters located at the top of the machine, which cut one slot at a time. As the drum continues to rotate, the nuts drop out and are set in position again for the cutting of the second groove. Any nut from $\frac{3}{4}$ in. to 2 in. may be handled on this equipment.

Washing.—All nuts, with the exception of track bolt nuts, are cleaned in a hot chemical solution which cuts the oil. A very slight film of oil remains to protect the nuts against rust. Nuts to be washed are dumped into the hopper of the washing machine, and from there drop into a drum which holds the cleaning solution. This is equipped

with steam pipes for keeping it at the proper temperature. The nuts are agitated in the solution and pass on to a rotating screen which allows the surplus liquid to drain off. A short belt conveyor on which they dry by their own heat carries them to a container.

Belt Inspection.—After washing, all cold-punched nuts are sorted, receiving a 100 per cent inspection. This so-called "belt inspection" is something that the plant people consider especially worth while, and is a very thorough job. The nuts travel on belts passing before a number of inspectors. After inspection the nuts go in containers to the warehouse. Special nuts go direct to packing and shipping floors.

The procedure described covers the operations involved in finishing the different kinds of the regular sizes of nuts. Large nuts, particularly special ones, are finished in the machine shop.

A division of the finishing department is given over to facilities for doing special cold forming jobs. These include punching machines, presses, shears, etc.

(In a subsequent article, the finishing of bolts will be described.)

Advocates Arc Welded Steel Construction

ARC welding for steel construction was discussed at the meeting of the American Gear Manufacturers Association, Buffalo, Oct. 11, 12 and 13, by J. F. Lincoln, vice-president and general manager Lincoln Electric Co., Cleveland. What he had to say was in part as follows:

"Structural steel," said Mr. Lincoln, "has a tensile strength of approximately 60,000 lb. per sq. in.; the strength of cast iron is but little more than one-fifth of this. Structural steel has a modulus of elasticity of 30,000,000; cast iron a modulus of elasticity of 12,000,000. In general, a factor of safety twice as great is used for cast iron as for steel.

"The price per pound of structural steel is no more than one-third that of iron castings. Translating this, if a structure is to be made the efficiency of which depends upon tensile strength, the material cost, if made from structural steel, will be no greater than one-fifteenth of what it would be if made from cast iron. If the factor of safety were to be taken into consideration, the ratio instead of being 15 to 1 would be 30 to 1. If the structure depends for its success on its stiffness, as in bases, bridges, etc., the ratio would be $7\frac{1}{2}$ to 1 without the factor of safety, and 15 to 1 with it.

"It is evident, therefore, that the ratio between the material cost of the same structure, when made from structural steel or cast iron, is great enough to permit a great deal of welding to be done on the steel structure and still make a very considerable saving over a cast structure."

Motors, arc welding machinery and other products of the company in which welded steel parts are used in place of castings, were shown by lantern slides. Redesign of many of these parts to permit the use of welded steel, was begun several years ago, and it was stated that, in general, there has been a reduction of at least 50 per cent in the cost of the structures.

Mental inertia, fear of change in appearance and the lack of information by committees and technical bodies were discussed in connection with the failure to use the arc welding process in many possible applications.

Sees Wide Use of Welded Steel In Next 10 Years

Within the next 10 years, 85 per cent of the castings being made today will be replaced by welded steel parts, said Mr. Lincoln.

"The profound result of this on industry can be well imagined," he said. "Inventories of castings will be replaced with inventories of structural steel taking about one-fourth the space and at one-tenth the cost. Pattern storage and pattern development, which heretofore has

been a very large item in manufacturing cost, will be eliminated. Breakage and scrap, heretofore an appreciable item, will be done away with because any part which is wrongly machined will be welded up and re-machined. Steel does not break in handling as does cast iron. Hence another great waste will be eliminated.

"Changes in design which heretofore have been difficult will be greatly simplified, and instead of the same model being manufactured without change over a long period of time, changes will be made continually because of the ease, and because of the entire elimination of pattern equipment. Deliveries of special machines will be greatly shortened and the weight of all machinery will be materially decreased.

"This change is not going to be a revolution, it will be an evolution. It does not mean that your present organization must be replaced; it does mean that your designers and your plant officials must become welding-minded so that they will see a structure not as an accumulation of castings and rivets, but as a structure built up by joined pieces of steel, making a much better structure at a much lower cost."

Use of welded steel in the manufacture of shears, punches, iron workers, fans and bases, was outlined by C. A. Booth, the Buffalo Forge Co. Gears of welded steel plate have been made experimentally. Those made so far have been noisy, but they are being redesigned and it is expected that the noise will be eliminated.

Rockwell Hardness Tester Compared with Others

British comments on the value of the Rockwell hardness testing apparatus were presented before the (British) Institute of Metals at its autumn meeting in Liverpool, England, Sept. 5 and 6. In a paper, "The Rockwell Hardness Test," by J. E. Malam, Birmingham, England, the author described work carried out to furnish data for conversion between (1) Rockwell and Brinell and (2) Rockwell and scleroscope numbers for 95:5, and 70:30 copper and 63:37 copper-zinc and 80:20 cupro-nickel alloys.

An examination of these data led to the conclusion that the Rockwell ball test in its present form yields so-called "hardness numbers" which must be considered as quantitatively misleading. Similarly it was found that unscientific results are obtained owing to the arbitrary numbering of the scleroscope scale. It was suggested that a representative committee be set up in order to consider the whole subject of hardness testing.

Selling to Maintain Prosperity Margin

Control of Distribution Costs Requires Better Understanding Among Competitors to Curb Professional Buying

BY W. C. CONGER*

FOR any study of sales application, Control of Selling Costs should be divided into four divisions: first, creation of demand; second, establishment of outlets; third, influencing of markets, and fourth, maintenance of sales spirit. Direct returns are possible from capital expended within the second division, while returns for capital invested to bring about results within the first and last two divisions are more indirect.

Creation of Demand

Advertising and personal contact of promotional representatives are the prime means of creating demand. Both efforts should be used in connection with specialty products. For commodity products, constructive advertising alone proves to be sufficient.

Advertising is selling on a mass basis. Its aim is the education of every possible prospect on the product and creating in him the desire for it. Mass selling is more economically done by advertising than by salesmen. There it, however, no more fertile field for the waste of hard earned margins than in the blanket acceptance of an ad-

vertising program, or the execution of a set program without due regard to changes in market conditions.

In the specialty field advertising can best be considered as an introduction for salesmen. It is educational work performed for the purpose of conserving salesmen's time in making explanations, and for the purpose of breaking down sales resistance. Advertising of specialties can be materially supported by the use of promotional sales representatives, making personal presentations and soliciting local assistance. This type of work is performed by an individual or squad of individuals and should never be undertaken unless it is obvious that it will pay to establish some type of local "follow through."

Properly planned advertising in the building field costs between 1 per cent and 3 per cent of the gross volume of business developed; promotion representation generally costs between 3 and 5 per cent of the gross returns, and it is not unlikely that, in cases of extremely scattered contact, it may cost as high as 10 per cent. Unless a substantial percentage of working margin can be made, traceable directly to these returns, a venture is not advocated.

Branch Manager Responsible for Expenses of His Office

BRANCH representation and distribution through dealers are the two main methods of establishing outlets. Expenses of branch offices are controlled best by taking advantage of basic influences. The manager should be made responsible for all expense items. His quota should be a direct ratio of his expense rather than sales expectancy. His bonus should be at a fair rate, never starting above the figure at which the office is producing a return to the company. It should be relatively easy for the manager to earn a bonus for special effort, and that bonus should be paid to him as promptly as possible.

All branch offices should operate on a budget system with expenses sub-divided as follows: Local advertising, automobile maintenance, commissions payable, engineering, insurance, dues and subscriptions, office supplies and postage, rent, light and heat, salaries, taxes, telephone and telegraph, traveling and special expenses. All items with the exception of postage, telephone, telegraph and traveling should be subject to home office approval prior to commitment. Even home office approval must be influenced by policy in preference to circumstances, because circumstances are so liable to control policy.

Local advertising is an item which implies advertising in local media and is not covered in the company's general advertising program. It is local because it identifies the local branch office only and is not beneficial to any other

sales unit outside its territory. The expenses not budgeted must be controlled by the home office management.

Automobiles Provide Frequent Contacts

Automobile maintenance is important because it must be remembered that today's prosperity is due mostly to the frequent contact, with a greater number of sales opportunities made possible, by automobile transportation. Men cannot keep pace with the times without facilities of rapid transit. Sales volume is always in direct ratio with sales contact. It is true under some circumstances it does not pay to maintain extended contact, but it is difficult to single out such circumstances without jeopardizing positive leads for sales. Men drawing \$300 and over per month should arrange for their own automobiles. The company should not be asked to make any consideration for their going and coming from work, but should pay them for the extent to which they use this investment for strictly company business, remembering that depreciation on a car is only slightly increased by the additional business mileage and so should practically all be absorbed in his competitive wage. Of the three possible methods of granting allowances, the monthly allowance, with the recognition for special items, seems most practical and free from misuse. This allowance should be established in accordance with the average mileage expected from the men, with allowance, usually at the end of a year's service, for reconditioning. Young salesmen covering commodity fields, and spending most of their time contacting prospects, should probably

*Vice-president Truscon Steel Co., Youngstown. From an address before Concrete Reinforcing Steel Institute, Shawnee-on-Delaware, Pa., Oct. 2.

have automobiles furnished them by the employing company.

If an organization is operating on the branch office plan it cannot afford additional sales expense in the form of commissions. Contact is all the commission man has to sell and it should be the policy of branch house sales organizations to establish their own contacts and pay excessive rates for outside contact only as special circumstances warrant.

Dealer Distribution for Commodity Products

Dealer distribution is more naturally used in forming a sales organization for commodity products. Dealers are already locally established and successful with certain lines. The direct expense to them of adding a few more commodity products for sale to their regular customers would not add proportionately greater sales costs.

Dealers are not promotional organizations; they are service organizations and when dealers are used for servicing the company must shoulder the responsibility of creation of demand and training of personnel together with market influence and sales spirit.

Dealers usually prefer buying their products outright, keeping the margin derived from resale to themselves. It is not, however, as simple as it sounds because market influence is a national as well as local responsibility and always falls upon the manufacturer as a sales expense. The

dealer will demand lower costs whenever national market influence lowers his resale market and will object, through his weapon of competitive buying, to having his costs raised in the event the manufacturers' investment in market influence proves satisfactory.

Dealer sales organizations are not subject to the definite control of branch office systems, because all items of local expense previously mentioned obviously fall under the jurisdiction of a local independent authority.

Sales Costs Must Be Kept Low

It is as essential that sales costs do not materially exceed competitor's sales costs as it is that production costs do not exceed his. Too rapid contact development increases sales expense out of all proportion. The fact that a certain product is successfully marketed by one organization does not mean that the field is a fertile one from which any group can derive profits. Too many times a house branching into a new line allows its determination to overtake its business judgment and allows inexperienced management to excuse poor returns on the theory of "buying a market."

Administrative expense is subject to top-heaviness both in the form of non-producing employees and non-essential records and accounts. Records kept should have the benefit of constant review of executives and such as are not absolutely essential must be eliminated before they reach the state of expense without return.

Influencing Markets Requires Cooperation of Leaders

MARKETS can best be influenced by constant personal contact between the leaders of those markets. The marketing problems of any two industries or of the same industry within any two cities are not identical. Before any real progress can be made toward market influence it is necessary to have the leaders in each industry and the local leaders within every district personally acquainted. It is essential that they meet in conference often and discuss openly their opinions, handicaps, and progress. Market influence or market control is possible only when those few executives who control the sales policies of the sources of supply sincerely want it. The surest way to invite price competition is to refuse to understand someone who has a right or who is willing to put investment and sales effort back of a market.

There is no necessity for collusion or market frame-ups. There is a necessity for the smaller man realizing that business expansion can be brought about only by exercising the one fundamental of business—service; that any expansion gained by him through cutting the market is ill-gotten and deceptive, and no matter what his gain, it would have been greater had he placed the same brain power back of constructive distribution and secured what share of any locality's business rightfully belonged to him through the character of his market service, at a market level that insured the prosperity margin to all.

Contact and understanding between competitors both locally and nationally is essential in properly sizing up the buyer's arguments. Buying today is being more scientifically handled than selling. In justice to the purchasing agent, however, buying which increases previous quantities by several hundred per cent, and asks for the saving occasioned by the increased quantity to be put into quality, is by no means condemned.

A few months ago the purchasing agent of a large automobile company placed an order for 1500 tons of sheets with a steel company. It was followed a few days later by an order of 3000 tons at a reduced price and with the insistence that the 1500 tons previously placed should be lowered to that price or the entire amount would be given to

a competitor. The president of this automobile company was called into the transaction and the entire volume was placed at the market, because he could realize the danger of such scientific purchasing lowering the margin on steel to a point where wages might be reduced and the demand for automobiles curtailed.

The purchasing agents of our large industrial units today have a greater influence upon the national prosperity than any other group of operators. It behooves sales managers whose responsibility it is to create demand and include the prosperity margin to offset this professional attempt to eliminate it. Buyers are not to blame. Purchasing agents are what sales executives have made them.

Competitive Understanding Necessary

Can sales organizations afford to allow professional buyers to continue to deceive their representatives, and in turn allow representatives, realizing too late that they have been deceived, to concoct additional circumstances to clear themselves and sell the orders at cost? Is it not better for sales executives to spend sufficient time together to understand each other and to realize that there may be divergent opinions of true values. If they cannot secure true value for goods, if contact on service is not sufficient to give recognition at true value, then they should refuse to furnish those goods at less than true value.

Everything in competitive understanding works back to the executives in charge of the sources of supply supporting and appreciating each other and of their refusing to ship goods below cost. Special blanket contracts to large customers, or any manner of protected coverages within any industry should not exist. They only make it necessary for the competitor to reserve the privilege of meeting price competition as he finds it. Such an open privilege exercised on the part of any competitor is sufficient to destroy any market.

The real cause for price cuts is not the mere existence of excess capacity, but the blind grasping for volume to use that capacity. In reality, it matters not whether excess

capacity be 5 per cent or 40 per cent. Grasping for business to fill it is destructive.

Executive Review of Contracts

Supplementing the general market influence, every company should have a field check and a home office check on every contract, and both should be exercised before the company is legally bound to the contract. Our company has recently established a system of executive review of every contract. Each individual contract is analyzed from the standpoint of gross margin over platform cost. Different gross margins are possible within different branches of the company, but we have at our finger-tips what the gross margin in every community should be, and when they vary, we find out why. Our margin this year, influenced considerably during these months by the tremendous demand, is likewise influenced by our insistence upon our men that we will not accept business which does not carry its proper gross margin.

Every man is penalized $7\frac{1}{2}$ per cent in sales credit for every 1 per cent in which that gross margin on every contract is lower than that correct level. He is thereby made a part of securing correct margins and if he cuts a contract 5 per cent, he is penalized $37\frac{1}{2}$ per cent of his sales credit, and his bonuses as previously stated are all paid upon the amount of contest credit which he secures over his quota as established by a ratio to his expense. No salesman in any line of specialty business should be allowed to operate without such basic influence supporting correct prices.

A representative's competitive conduct should never require further time and thought in covering up his action. It is far better that he sacrifice business to his competitor than to conduct himself in a manner requiring subterfuge. He should realize that his customers are happiest when they are all paying the same price for their materials. Competitors are all human in their understanding and readily detect unfair methods used against them, with the result of loss of confidence toward future fair dealings.

Many sales policies include the fallacy that the customer is always right. In national markets, however, it is more important to be right with competitors than with cus-

tomers. There are always relatively few competitors who could, if they would apply themselves to the task, influence every industry to prosperity. They cannot be expected to accept excuses in each other's conduct toward common customers and so errors should be corrected to the understanding of these competitors. What does it mean to reduce sales expense by 1 per cent through rigid economy, while on the other hand, through lack of confidence among a few, legitimate profit is cut 50 per cent? This loss in profit is actually an added sales expense.

Pooling of Interests Reduces Costs

Certain industries have reduced their sales costs and increased their competitive understanding through the establishment of quantity survey institutes or estimating bureaus. Such bureaus eliminate duplication of effort, reduce unit costs of estimating and create additional confidence because the estimate held by each competitor is identical. It is a practical method of eliminating cheating or buying by confidential quotations or deliberate omissions.

In some industries honest cooperation might lead to consolidation of facilities within given territories. A lesson might be had from the German industries, which function through what is known as a "community of interest." The firm better equipped to handle an individual operation is allotted that work. There is no need to maintain warehouses and bending facilities within the territories which can afford only one plant. What difference whether reinforcing bars are cut in one yard or another? It is wasteful to have several yards adjoining one another, all working half-time on orders accepted at cost, because of the existence of the other yards. Why not have a product made where it can be made more economically? It would be better for a company to supply another with what it can produce more economically, permitting each firm to sell in its territory free from stiff competition, rather than be subject to excessive and overlapping sales expense.

A "community of interest" within an American specialty industry could extend further than the warehouse facilities. It could extend to having details made by a central bureau. Such seems entirely possible in our vision of the future.

Sales Spirit Depends upon Attitude of Executives

A SALESMAN'S spirit is best maintained by his superior's interest and appreciation of his success. Eliminate too severe criticism, but never go without allowing him to realize that his shortcomings are understood. Every man needs help, not only from his superior, but from his colleague. Convince your personnel that he climbs highest who helps the other most. The moment you find any of your regulations pitting one man against another, charge yourself double before you allow sales energy to be wasted between your own men in conflict.

If two men have worked on a contract over-extend yourself to credit them with it. Your money cost will be repaid many times by the increase in your salesmen's spirit. Industrial management depends more upon management of men than of machines.

Men develop best under strain. They must have problems and they must meet them with the understanding that work is the cornerstone of real happiness. Many times this strain may be of such a character as to cause your men temporarily to misunderstand. Many men stake their jobs upon a single act or decision. They should be corrected every time they approach the breaking point.

Recognition of Services Important

Recognition can be accomplished by individual quota, prize contests, personal letters and visits from executives,

salary increases and promotion in the form of added responsibilities. Prize contests are splendid individual and group incentives. They can be staged between organizations or different communities with the sales opportunities equalized by means of quota and with prizes given to individuals or those teams, departments or offices who within any given period of time, days, weeks, months, or quarters, excel in sales success over their opponents.

Chief executives should personally correspond with the men on the firing line to have their minds influenced by the state of mind of the one who is most vitally in touch with the company's problems. Periodical visits also prevent the local sales manager's viewpoint from being distorted by his closeness to the problems and the broad company's viewpoint can be understood only by personal contact with the leading spirit. It is impossible for any chief executive to visit any local manager without that manager confessing that he has gained new viewpoints.

Company prestige should be maintained at all costs. Men should not be allowed to influence customers from a personal relationship but rather because personally they represent the best organization and the best products. It is a tremendous handicap for a salesman to have a customer feel that he is dealing with him in spite of his dislike for his company.

More Welding on Steel Structures

Welding Society Hears About Four Buildings, One a 12-Story Hotel—Fabrication Shops Avoid Handling Large Pieces

STRUCTURAL steel welding, both in the fabrication shop and for field erection, was the principal topic of discussion at the general meeting of the American Welding Society, held in Philadelphia, Oct. 9 to 12. A digest of the matter presented on this topic is given in the notes below. An interesting talk and motion picture showing the manufacture of steel automobile bodies was also presented. Mr. Meadowcroft's remarks on this topic, describing many new labor-saving devices and machines, will be abstracted in a later issue.

Space prevents a lengthy account of two other topics considered. A paper entitled "Standard Line of D.C. Machines Fabricated by Arc Welding," by R. S. Marthens, C. C. Brinton and F. T. Hague, showed how the Westinghouse Electric & Mfg. Co. has been able to standardize details on its line of medium sized machines, and has

thereby effected many collateral economies in inventory, machine shop and foundry work, and at the same time improved the operating characteristics of the motors.

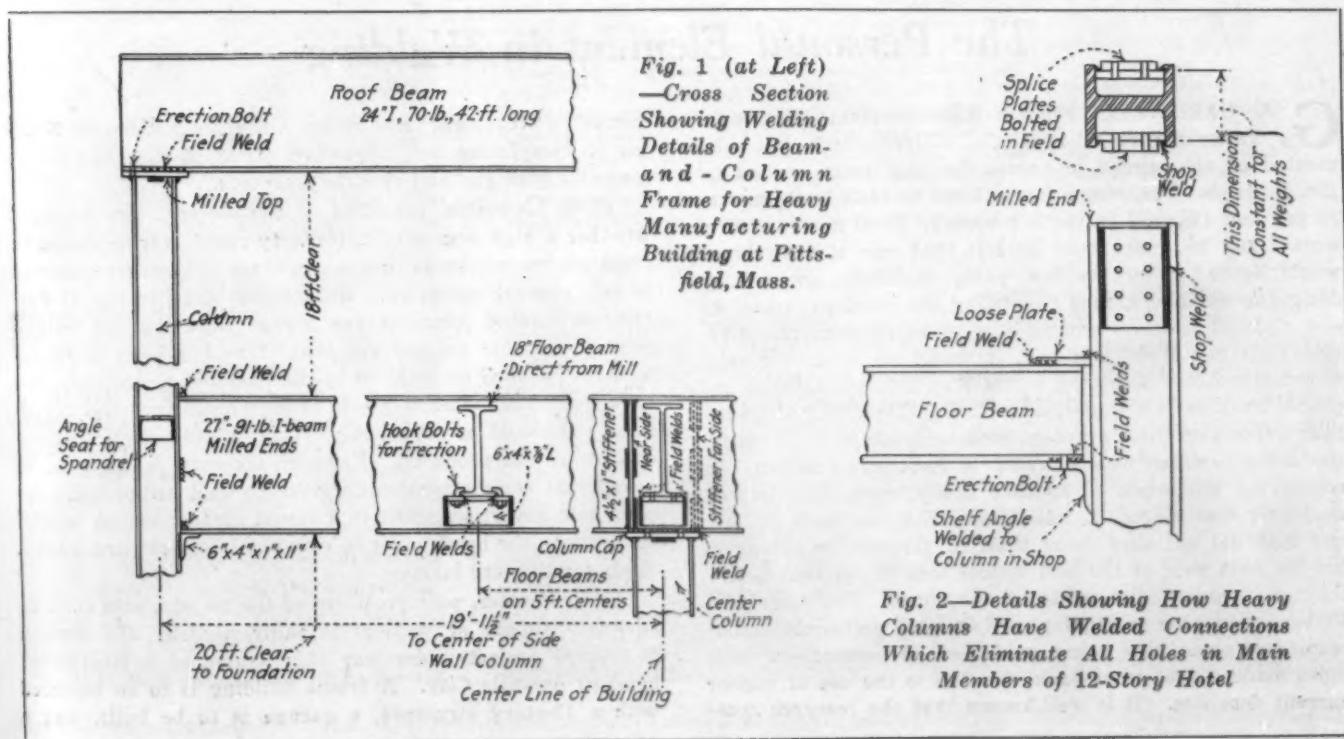
Two lengthy papers describe the research work undertaken by the San Francisco section. A number of tension test pieces were made under commercial conditions, using both the gas and electric processes. These were then pulled while heated in Prof. Charles Moser's laboratory at Leland Stanford University. Most of the specimens broke in the fire box plate (ultimate strength at room temperature about 67,000 lb. per sq. in.) rather than in the weld metal. Results for the welded joints, therefore, closely paralleled those for the unwelded check specimens: ultimate strength as determined by loading at normal rates increased with temperature to a maximum at about 575 deg. Fahr., above which the values dropped rapidly.

Fabrication of Two Buildings for Heavy Manufacturing

IN a paper entitled "Present Status of Welding Steel Buildings by Electricity," Frank P. McKibben, consulting engineer General Electric Co., noted that a recently compiled list of welded structures included 43 buildings, eight bridges, 28 ships and pontoons, and 11 gas holders. On account of these successful applications he is of the opinion that it will now be comparatively easy for building codes to recognize this new method of construction, espe-

cially as many of the important ones are under revision, to permit the change from 16,000 to the 18,000-lb. unit stress basis sponsored by the American Institute of Steel Construction.

He also presented details of two new welded buildings recently erected by the General Electric Co. One of them, a 42 x 66-ft. extension at Bridgeport, Conn., contains four welded trusses placed on tall steel columns. As in the



building at West Philadelphia (described in *THE IRON AGE* for March 22), considerable saving in weight was effected by eliminating all gusset plates. The Bridgeport trusses were made with T-section chords (a 14-in. beam split down the center of the web), with the angle-iron diagonals edge-welded directly against the stem of the T. At the peak of the roof, the top chord was welded on top flange only; the stem is spliced by welding along each side of the leg of the angles which constitute the central vertical member of the truss.

A two-story beam and column building, 42 x 280 ft. in area, erected at Pittsfield, Mass., was so designed that the floor beams were shipped directly to the site from the mill, thus saving shop handling on a considerable percentage of the total weight. Erection details were also arranged so that nearly all welding was done in the "down" position and no "overhead" welds required. Fig. 1 shows the principal features to be that the floor girders have milled ends, thus allowing them to be welded to the column face, making a rigid transverse bent and fixing the ends. This permitted considerable economy in steel, provides for all wind stresses, and lines up the building precisely during the erection stages.

In both these buildings a unit shearing stress of 3000 lb. per linear inch was used for $\frac{3}{8}$ -in. triangular fillet welds.

Welded Frame for Hotel

Discussing this paper, J. H. Edwards, chief engineer American Bridge Co., said that experience has now been accumulated on nearly all varieties of building frames. Heavy manufacturing buildings with trussed roofs, long columns, traveling and jib cranes and beam-and-column buildings as high as five stories have been successfully erected. He then proceeded to describe the 12-story Homestead Hotel, just completed at Hot Springs, Ark. His company had accepted the contract at \$8 a ton more than a riveted design would cost; welding was required in order to avoid disturbance in inhabited portions of adjoining hotels. Actual costs were somewhat in excess of the contract price. Two welders had no difficulty in keeping up with the erection gang.

Details for this tall tier building were worked out so

as to avoid handling heavy pieces in the shop. Where erection holes were required, it was usually possible to put these holes in a light detail, and then weld the detail in place. Column splices, for instance, were plates made to fit snugly within the outstanding legs of the H columns, and welded in proper place, as shown in Fig. 2. Splice plates were then fitted to the outside to make the joint with machined bolts. Beam seats were also fitted between flanges in a similar manner. Such splices and beam seats were placed a uniform distance apart on each column, irrespective of section. This enabled the beams framing into them to be of uniform length and punching. Use of a loose top plate to fix the floor beams at the end is also indicated in Fig. 2. A peaked roof was erected by carpentering methods, i.e., the rafters were hoisted to place, cut to length, and fillet welded to the wall trusses and hip rafters. No blueprint details of this roof were prepared.

Full sized details as described above were tested at the Bureau of Standards. A column splice sheared through the bolt holes at a load of 340,000 lb. Loaded as a beam, a spliced column broke through the welds at 548,000 lb. Beam seat angles ranging from 4 by 4 to $3\frac{1}{2}$ by 8 in., welded between column flanges, bent down like a stirrup before the welds tore loose. A series of test pieces designed to break a $\frac{3}{8}$ -in. weld in shear gave the following ultimate strengths: Average, 13,400 lb. per linear in. (Maximum, 15,400; minimum, 11,300.)

Marshall Williams, assistant general operating manager American Bridge Co., Pittsburgh, said that experience in fabricating several sizable buildings had convinced him that, while welding is frequently quite advantageous to structural fabrication, it is by no means a universal tool. Among the advantages he cited light truss construction, where it eliminates many plates and minor details. Heavy building columns, after the ends have been milled, may have all details welded on them, thus avoiding further handling. Among the disadvantages are the number of expert welding supervisors required, and the slow rate at which the process operates. Both these increase overhead charges, the latter principally by decreasing the output capacity of the plants. Further experience with the process, it was pointed out, would correct the two difficulties mentioned.

The Personal Element in Welding

G. A. CALDWELL, general superintendent Mississippi Valley Structural Steel Co., Melrose Park, Ill., commented on the spread in values for unit tests, quoted by Mr. Edwards. The range from 11,300 to 15,400 amounts to 36 per cent (figured on the low value). Until more uniform work could be guaranteed he felt that one of two things would occur—either the low value would be adopted by designing engineers, thus penalizing the good workman, or else risks of poor workmanship must be encountered. Certain tests convinced him that it would be relatively easy to grade welders according to their ability, and to keep the poorer ones on less important details. Thus he had tested four welders on three different occasions, some weeks apart; the same ranking was attained in each examination. In comparing the work of another group, each man having made six test pieces, it was found that the work of any one man did not vary more than 10 per cent in strength, but the best weld of the best welder was 35 per cent better than the poorest joint made by the worst. Professor McKibben, answering an inquiry, said that the uniformly higher results of tests now being published, in comparison with those made a few years back, are due to the use of higher current densities. It is well known that the research com-

mittee on structural steel of the American Bureau of Welding is completing an exhaustive series of tests on joints made by both gas and electric processes.

F. T. Llewellyn, president of the society, was doubtful whether a high degree of uniformity could ever be expected from all the workmen in a shop, since it is never attained in any manual operation. He doubted whether the uniformity in riveted joints is any higher than that of welded joints. He also pointed out that there has been more research expended on welding in the past five years than has been put on all other methods of fastening since the beginning. It would be surprising if some mildly conflicting results were not produced. From an erector's standpoint, he asked that some attention be given to field inspection. An open hole advertised itself to a casual glance; but on welded connections the beads must be counted, measured and gaged. Tools for this are lacking.

F. M. Farmer, past president of the society, said that an adequate supply of welders is badly needed. He cited a \$6,000,000 project under way this winter at a Boardwalk hotel in Atlantic City. A frame building is to be replaced with a 13-story structure, a garage is to be built, and a

power house enlarged. Noisy riveting is prohibited, but the hotel building must be completed early next spring. Not being confident of obtaining sufficient personnel, the con-

tractor decided to weld only the power house extension. The hotel frame is to be bolted throughout, and the garage to be made of reinforced concrete.

Erection of Buildings by Welding

A PAPER of the above title was presented by J. C. Lincoln, president Lincoln Electric Co., Cleveland, based largely on experience gained on a four-story business block designed by the Austin Co. As an evidence that design must be made especially for welding, this building departs from the now standard practice of running the columns straight up from foundation to roof, framing the floor beams into them, and goes back to the old fashioned "mill building" construction, where the columns are a single story high, and the main floor beams are continuous from end to end. Special stiffeners are required to transmit the loads from the stories above down through the beam to the column beneath. While this system is all right for low buildings, some structural engineers present doubted whether it would be suitable for tall, narrow buildings which have to resist heavy wind stresses.

Mr. Lincoln said that worth-while economies would not result if the building were designed as if for riveting, and then welding substituted. The shop and erection costs would then be of the same order. Notable savings in steel result, however, if each column is proportioned to the load it is to carry, rather than going two or three stories over-size, if the floor beams are made continuous and fixed at the ends, and if the main girders are reinforced at the center of the span by cover plates and at the supports by web stiffeners. He sketched many devices used for erection

purposes: in general they consist of shelf angles or clips welded to the adjoining members, each with two holes for preliminary bolting. After plumbing the building, all such joints would be properly fixed by welding. Variations in mill lengths of beams cause no trouble if slotted holes are punched in the clips welded to them. The following points must be considered to profit most by structural welding:

1. Design joints to eliminate overhead welding, and minimize vertical welding.
2. Do no more welding than is necessary to carry stresses.
3. Utilize continuous beams of non-uniform cross section.
4. Use "stepped" columns.
5. Bolt up the erection, as at present.
6. Avoid open holes in heavy pieces.
7. Ship as much steel as possible direct to the job.
8. Use large electrodes and large currents.
9. Scarf nothing thinner than $\frac{1}{2}$ in.
10. Use only tested welders.
11. Inspect all joints carefully.

As to costs, Mr. Lincoln said that field welding on this building cost \$2,500. A reliable estimator predicts that this would drop to \$800 by the time the fifth such building were erected.

Floods Fenced Out with Steel

TO protect a half-mile stretch of road against encroachment by the Santa Ana River channel, the California Highway Commission has constructed a novel revetment. Steel pipe is used to replace timber piles, experience having shown that the latter rots below the ground level and fails at critical floods.

As shown in the illustrations, the bank protection consists of a double row of posts, placed 6 ft. on centers. The vertical members are 3-in. pipe, heavily galvanized, approximately 20 ft. long, driven 14 ft. into the ground. Braces are made of the same material, flattened and bolted at the ends, as indicated.

Along the row of posts on the river side there was placed two 58-in. widths of Ellwood fencing, lapped 20 in. at the ground line, where the wear will be the greatest. The upper width of fencing came to within 18 in. of the top of the posts and extended 4 in. below the ground surface, while the lower width of fencing extended 42 in. below the ground surface.

One 58-in. width of the same fencing was fastened along the back row of posts and extended 10 in. below the ground surface with 4 ft. above the surface.

When all fences were in place, the 6-ft. space between the two parallel lines of fence was filled with brush and rock to weight it down.



Urges Study of Business Trends

Need for Considering Changing Conditions, to Avoid
Nullifying Production Economies, Pointed Out
at Meeting of Industrial Engineers

THE industrial engineer must expand his horizon beyond shop walls and observe the broader currents of business, if he is to anticipate changes that might otherwise offset savings wrought in production, according to Ray M. Hudson, assistant director of the Bureau of Standards, Department of Commerce, who addressed the fifteenth annual convention of the Society of Industrial Engineers, held at the Chamber of Commerce, Rochester, N. Y., Oct. 17, 18 and 19.

"Campaigning for Lower Costs" was the general subject of the convention, which was held in cooperation with the Industrial Management Council of the Rochester Chamber of Commerce and the Rochester Engineering Society. Mr. Hudson's address, delivered at the opening session, was on "Management's Opportunities for Cost Reduction."

"The costs of the changes forced on a business by the new competition, hand-to-mouth buying, market shifts, the migration of industry, research and invention may have absorbed to a greater extent than we realize the economies and savings wrought in production," said Mr. Hudson.

"The question is: 'Could these changes have been foreseen and if so, could they have been handled so as to avoid this absorption of profits?'"

"My answer is 'Yes,' for I am sure the industrial engineer is capable of sensing the approach of new conditions and problems in industry and of preparing to meet them efficiently and economically. But to attain this preparedness, he must first expand his horizon beyond the shop walls and perfect his observation of the broader currents of business. He can do this through review, interpretation and use of the statistics of business. To ignore these indicators of trends is to be caught napping. . . . Why spend months or years perfecting some part of shop management technique if the whole program is 'washed out' by failure to observe important market changes or shifts in the buying habits of your customers?"

Must Reckon With Certain Recent Developments

The contribution to lower costs made by planning and scheduling, labor saving machinery, progressive assembling, and other "primary tools of good management" was emphasized. "There is, however," he said, "a large area of American industry into which these fundamentals have not penetrated, and there is still great opportunity for management to cut costs and assure profits through their wider application."

"Nevertheless, in our zeal to spread their use and to perfect the technique of their application, we must take care that we do not overlook or underestimate the importance of certain recent developments, developments which in their cumulative aspect are altering the very structure of that great organism we call American business. We need to reckon with these newer developments, and learn how to guide, control and apply them to the end that they also may contribute lower costs."

One of the problems discussed was the competition between entire industries as distinguished from that between member plants of a single industry. On this Mr. Hudson said: "The effects on business of the new competition are not easily counted. Nevertheless the pressure it has ex-

erted on old established businesses is evidenced by the struggles some of them are making to hold their places in the line. Products, processes and machinery are being revamped; intensive sales and advertising campaigns are being conducted. Installment selling, liberal credit and financing terms are offered the consumer. But it is not at all certain that these will perpetuate the business offering them and assure a steady or consistent profit. It is still necessary to determine whether some of these endeavors are merely temporary expedients or whether they are permanent features of the new order of business.

"Therefore one of the immediate problems of the industrial engineer is to determine the effects of the new competition on the business with which he is connected. Another of his newer problems is the correct evaluation of the measures or means employed in meeting that competition."

Hand-to-Mouth Buying Affects Production Economies

Hand-to-mouth buying and the small order problem, the next to be taken up, were said to have brought a host of problems in their train. "The conditions giving rise to these developments, the probability of their duration as well as the ways and means to cope with them are also of interest to the industrial engineer. For example, how can he show a profit if short runs on small quantities, frequent changes of machine set-ups, etc., absorb the economies he makes through time study?"

"Along the selling side of the business are these questions: What market shifts are occurring in this field? Is the future of the business in the domestic or in the foreign market? What is a market anyway? Is our common conception of a market, as a vast reservoir to be filled, correct? A market originates in human wants. Therefore markets are people, not places. People move about; they take their habits with them. Sometimes they stay in the same place but change their habits. May we not therefore regard human wants as the prime source of business, and that the market they reflect is not a reservoir, but a 'spring' that flows steadily, year in and year out. Nature provides the spring, man's job is to guard it against diversion, stoppage and contamination, especially if he expects to drink 'long and heartily' therefrom."

Migration of industry was pointed out as another development of recent years. "Studies show definite movements in many lines of industry," said Mr. Hudson. "In some lines, plants are moved closer to the source of raw materials; others closer to their markets; still others are moving to more favorable power sources, climatic conditions, etc. What underlies these movements? Are they undertaken solely because of present costs? Do these shifts, as and when made, assure lower costs and better profits? The answer to this question concerns the industrial engineer."

Research a Source of Larger Profits

Research—commercial, technical and scientific—was emphasized as a frequently neglected source of lower costs and larger profits. In this connection Mr. Hudson said: "There is scarcely any phase of business which cannot be strengthened by research."

"Analysis of markets, and back of them, the study of human wants, gives new conceptions of what to make and where to sell it. Studies of the rate of consumption, the potential buying power of the public, indicate whether or not the public can absorb more of your output. Analysis of present uses of your product, the study of fields of its possible application serve either to increase sales or to establish the point of diminishing returns.

"When to change the style, or redesign the product is not a matter of chance. 'Coming events cast shadows before.' Profitable management requires anticipation of, and insurance against, sudden shifts in the public taste or fancy.

Large Opportunities in Reducing Distribution Costs

"Management's opportunity for cost reduction through research along the distribution side of business is tremendous. Studies of present channels of distribution, the methods employed in each, the actual routes over which goods move, the ways in which goods are packed and shipped, the types of containers used, machinery and equipment for handling goods in transit—every one of these can be studied with profit. To assume we have reached the peak of refinement of simplification in any one of these features is absurd. The greatest opportunities for cost reduction are in distribution. There is no question about that, for practically nothing has been done in this direction, when compared to the great concentration of effort toward reducing production costs. We could well afford to let present production costs alone for the next five years and focus all our energies on whipping this distribution problem.

"Savings made in that end of the business are just as valuable a contribution to a satisfactory annual net profit as those made in production; and they ought to be easier to make."

In a New Era of Business

"Many of our industries seem to suffer from overfondness for 'things as they are,' said Mr. Hudson, in the concluding paragraphs of his paper. "At least there is a reluctance to 'change,' not entirely accounted for by opposition to the costs of making it. More of us need to look away from the 'good old days and their good old ways,' and take a longer look ahead. If we would be progressive we must watch new developments in both science and business, and be ready to adapt or apply them to our daily operations.

"We are in a new era of business, one in which scientific investigation, application and control are playing a most important part. Rule-of-thumb and empirical methods must give way to the new order. Profits are no longer the difference between selling price and cost. Instead they are the difference between new ideas and old ones, new methods and out-of-date ones, new equipment and obsolete."

Profits from Waste

A MENTAL attitude that abhors waste is the first requirement for waste reduction, said Virgil M. Palmer, engineer of industrial economy, Eastman Kodak Co., Rochester, in a paper presented at a session under the auspices of the manufacturing section of the society's waste elimination committee.

The paper was confined to waste of the materials of industry. This waste, it was pointed out, can be subdivided into three classes, according to its origin. 1. Waste occasioned through low yield or inefficient use of consumable tools, accessories and supplies, 2, waste due to failure to use the by-products from production operations, and 3, waste occasioned by obsolescence of plant, equipment and product. The first class of waste, it was said, should be reduced at its source; it should never be allowed to exist. Many industries have yield figures showing what is considered efficient use of material, and it is fairly easy to calculate actual yield figures in the manufacture of product.

Waste of the second class was emphasized as presenting

perhaps the most difficult, but the greatest, opportunities for profit. Among waste by-products which have been utilized, Mr. Palmer cited blast furnace slag, which, he pointed out, now forms half the volume of 150,000,000 barrels of cement giving, at \$2 per barrel, a gross return of \$150,000,000 per year.

The third class, occasioned by obsolescence of plant, equipment or product, was said many times to be justifiable. It is waste created through discarding the old for the new. It is the price paid for progress and is justified by the benefits attained.

American Scrap Industry Has Large Annual Turnover

"The result of all this is that there is a constantly increasing volume of material to be salvaged and reclaimed," said Mr. Palmer. "According to the magazine *Thrift*, the American scrap industry has attained a place in big business, with an annual turnover of \$1,000,000,000."

Reference was made to the research of the Buffalo chapter of the S. I. E. on "Profits from Waste," particularly the profits derived from its sale and reclamation. One of the objects of this investigation is to find and list some basic principles and common practices for salvage and reclamation work.

Of the 106 companies replying to the questionnaires 61 are rated at over a million, 12 were rated between one-half and one million, and 33 at less than half a million.

Large Companies Have Organized Salvage Departments

It was found that 47 of the 61 largest firms have an organized salvage department; 42 of these departments are operated as a subdivision of other departments, and five are self-contained and in charge of major officials. About half the firms rated between one-half and one million have salvage departments, but only 12 of the 31 smallest companies have such departments. This does not mean that the benefits of salvage are overlooked, said Mr. Palmer, but rather that the prevention of waste at the source is emphasized by many companies; and frequently in the smaller concerns prevention of waste at the source and salvage and reclamation are supervised directly by some major official without having a separate department.

Production superintendents are responsible for salvage in 17 plants; in 17 other plants this work is supervised by a salvage foreman.

In 60 plants, material to be salvaged is collected at a central point for checking, assorting and disposal. In 15 other plants this work is done in the department in which the waste originated. Unnecessary sorting is eliminated in many plants by having separate containers for each kind of waste, and by having the waste put directly into these containers where it is produced.

Replies to a question relating to the value of salvage work were read by Mr. Palmer, one of them being: "Would not attempt to function without it. Acts as a check on all departments and brings to the attention of supervisors all excessive or abusive use of materials."

"Dividend Requirements from Waste Elimination," by C. E. Knoepfel, managing director, Waste Eliminators, Inc., Boston, was another paper at this session.

Working on Time Study Standardization

PROGRESS made by the time study engineering standardization committee of the Society of Industrial Engineers was outlined by the committee secretary, W. B. Lincoln, Jr., A. J. Nystrom & Co., Chicago, at a dinner meeting, held during the society's fifteenth annual convention.

A comprehensive time study engineering bibliography has been compiled. The principal forms and makes of time study watches have been tabulated and recommendations prepared covering the types considered best suited for average use. Specifications for time study boards and other tools of the time study engineer have been developed,

as well as standard time study forms, instruction cards, etc., for use in a variety of industries. A treatise on "Preliminary Survey" has also been completed.

This committee was organized March 18, 1927, for the purpose of: "Formulating a standard time study procedure suitable for general adoption and which would agree in most respects with the best of the many diverse opinions and practices now prevalent in this profession, stressing particularly the necessity for correct standards of task measurement." T. R. Hough, Wilson & Co., Chicago, is chairman.

The standardization work is carried on by five subcommittees, one of which deals with bibliography and terminology, another with production measuring equipment and forms, and a third with time study procedure. The fourth subcommittee, on research, compiles data relating to feeds and speeds, inspection, working conditions, etc.; the fifth, designated as the subcommittee on review, passes on the work of the other subcommittees.

Papers presented at meetings held this year under the committee's auspices in Chicago and Milwaukee have been published in booklet form by the society.

"Time Study—Its Place in the Campaign for Lower Costs," a paper by T. R. Hough, chairman of the standardization committee, was also received with interest at this meeting.

A large collection of time study and related forms, showing wide diversity of practice and the need for standardization in various industries, was on exhibition during the three days of the convention.

Program of Wide Scope

OTHER sessions of the convention were devoted to the elimination of unnecessary fatigue, office management, sales, industrial management education and plant maintenance. Papers at the latter session, the chairman of which was Perry A. Fellows, city engineer, Detroit, were: "Applying Scientific Management Principles to Plant Main-

tenance Work," by R. R. Reese, plant engineer, Packard Motor Car Co., Detroit, and "The Status of Maintenance Organization," by V. S. Karabasz, assistant professor of industry, Wharton School, University of Pennsylvania. Speakers at the opening session included James E. Gleason, president of the Gleason Works and chairman of the Industrial Management Council of the Rochester Chamber of Commerce, and Dr. H. S. Person, managing director of the Taylor Society, New York.

Afternoons were devoted to plant visits, the plants of the North East Electric Co., Gleason Works, Bausch & Lomb Optical Co., Stromberg Carlson Telephone Mfg. Co., Bastian Brothers Co., Eastman Kodak Co., Taylor Instrument Co., and the General Railway Signal Co. being among those open for inspection.

Social features included the banquet, speakers at which were Dr. W. F. Rittman, president of the society, and Dr. E. J. Cattell, Philadelphia. Robert M. Searle, president of the Rochester Gas & Electric Corporation, was toastmaster. Demonstration of the Televox, popularly named the "mechanical man" at the last session of the convention, attracted large attendance.

Doctor Rittman Re-elected President

At a meeting of the board of directors, Dr. W. F. Rittman, Carnegie Institute of Technology, Pittsburgh, was re-elected president of the society. Eugene A. Rummler, engineer, Chicago, continues as treasurer, and George C. Dent, 1815 Engineering Building, Chicago, as executive secretary. New vice-presidents at large are John Calder, Springfield, Mass., and C. H. Gullion, Swift & Co., Chicago. Albion N. Doe, industrial engineer, New York, was named vice-president in charge of promotion. Perry A. Fellows, Detroit, continues as vice-president in charge of research.

A Rochester chapter of the S. I. E. has been organized, with Virgil M. Palmer, engineer of industrial economy, Eastman Kodak Co., president.

Precise Linear Measurements Discussed

Manual and Automatic Methods Surveyed in Two Papers Before Engineers

TWO speakers took up different phases of the subject of precise linear measurements in manufacturing at a meeting held in the Engineering Societies Building, New York, Oct. 17, under the auspices of the Museum of Peaceful Arts and the Machine Shop Division of the American Society of Mechanical Engineers. Dr. George K. Burgess, director of the Bureau of Standards, Washington, presided.

In his introductory remarks, Dr. Burgess referred to the successive advances in measuring practice, from those involving only geometry to those in which electricity was a feature, and later to optical devices, in the most recent form of which measurement by means of light waves has been effected. Standards of measurement are limited both by the constancy of the material of which the standard is made—a metallurgical problem—and by temperature. Means have been developed for introducing correction of temperature variation or eliminating its effects.

International standards are somewhat hampered by lack of uniformity with regard to the temperature accepted as a basis. In the United States this is 68 deg. Fahr., equivalent to 20 deg. C. In Germany it is 20 deg. C. In England it is 62 deg. Fahr. In France many measurements have been made at 0 deg. C., although 20 deg. is in use, also. Following a recent international meeting, for the purpose

of establishing uniformity in this particular, it is hoped that a universal standard will be adopted. Dr. Burgess expressed the belief that this would be at 20 deg. C., which agrees with present American and German practice.

Development of Linear Measuring

Manual measuring devices were discussed in the first paper of the evening, which was that of Prof. James A. Hall, Brown University, Providence, R. I. Regarding linear measurements, the paper referred to the methods in use a century or more ago as giving way to the greater precision of steel rules graduated on dividing machines, which became generally available about the middle of the nineteenth century. For certain purposes these scales were replaced with plugs or gages, rings, etc., by Sir Joseph Whitworth in England. The first vernier caliper was developed by Joseph R. Brown in 1851 and the micrometer caliper by the same man, then associated with Lucien Sharpe as Brown & Sharpe, in 1867. It did not come on the market for general use, however, until 1877.

Angular measurements were served for a long time by a plain protractor, which later had vernier attachments added. The most recent development is the sine bar.

Snap gages were in use 60 years ago. They were followed much more recently by the go-no-go gages, which

have played such a great part in modern mass production.

Gage blocks of great precision developed by C. E. Johansson in Sweden were brought by him to the United States in 1907, and have become an important part of the production of the Pratt & Whitney Co., Hartford, Conn. A set of 81 of these blocks will give dimensions from 1 to 2 in. in steps of 0.001 in. and from 2 to 12 in. in steps of 0.010 in. Comparators designed for checking up on interchangeable work, etc., were first produced about 1878, and have reached a high degree of precision and usefulness. It is easy to change the setting for new dimensions, and the machine does not depend so largely upon delicacy of the operator's touch as in some other instances.

Inaccuracies of precise measurements may result from temperature changes or from a deformation of the measuring devices due to minute pressures. The speaker said that a 10-deg. difference in temperature on a length of 4 in. induces a length change of 0.00025 in. in steel.

Automatic and Optical Measurements

A second paper, devoted to the development of automatic measuring devices and the use of optical methods, was read by Prof. Earle Buckingham of the Massachusetts Institute of Technology, Cambridge. He defined the primary purpose of such instruments as being to prevent mistakes, because at high productive speed a mistake will pile up the scrap heap very rapidly. Automatic measuring instruments are those which do not depend upon the delicacy of the feel of the individual operator. They may be divided into three classes:

- 1.—Substitutes for hand measuring instruments.
- 2.—Special devices or fixtures built into an automatic machine to measure specific products.
- 3.—Sizing devices built into the machine to control the size of the product.

Describing briefly a considerable number of these devices or machines, both for use of the productive operator and for inspection, the speaker referred to inspection of measurements as a vital production process. Consequently, equipment for this purpose is deserving of the highest quality in precision. The stresses induced in such equipment are very small and must be so, and the power required to operate it is inconsequential.

Over-Emphasis on Precision

Several speakers contributed to the discussion of the paper. In particular Eric Oberg, editor of *Machinery*, New York, expressed the view that we have altogether too much demand for super-accuracy. Devices developed during the last 20 years have, of course, made possible many things not previously attainable, but the trouble is, some

people wish to have everything go to these extremely precise dimensions. The speaker expressed the opinion that there is as much waste or unnecessary expense in our manufacturing procedure, as a result of attempts to attain accuracy beyond all reasonable needs, as from carelessness resulting in work which really is unduly inaccurate for the purpose for which it is intended. He estimated at 20 per cent the shop cost of manufacturing which could be saved by the use of common sense in determining the degree of accuracy really required by the case at hand.

Specific examples were cited to give point to the general statements. Slitting cutters were ordered which were to be exact within 0.00001 in. The quotation was \$100 each. Complaint at this price resulted in a conference, at which it was found that an accuracy of 0.0001 in. would fulfill all needs, and the cutters were made for \$4 each. A ring gage was demanded with an accuracy to 0.00005 in. The quotation was \$2,500 and the manufacturer was not sure that he could make a profit on it at that figure. He knew, however, that his measuring instruments were more precise than those of the prospective buyer, and that the latter could not detect deviation within the magnitude demanded. Again a conference, caused by the high price, resulted in a change in the precision demanded to 0.00025 in. and the gage, made on the cost-plus basis, was billed at \$315. In a third case a lead screw was asked for, to be accurate to 0.0001 in. and the quotation was more than \$10,000. It developed that the screw and nut were to be furnished by the same manufacturer, and that so long as the one fitted the other accurately, the measure of precision of either was somewhat immaterial. When this view was brought to the attention of the purchaser, revised specifications resulted in production of the screw for \$315.

Exhibit of Precision Devices

Following the meeting those present adjourned to the Museum of the Peaceful Arts, at 24 West Fortieth Street, to see an exhibit made by various manufacturers and which is to be in the museum for about 30 days. An effort is being made to extend this period to cover the meeting of the American Society of Mechanical Engineers, early in December. Among the exhibits were those of the Pratt & Whitney Co., Brown & Sharpe Mfg. Co., Bausch & Lomb Optical Co., John Bath & Co., Jones & Lamson Machine Co. and the United States Bureau of Standards. In addition to block, ring, snap and other gages, there were shown a number of the high-precision machines developed in recent years, including the sine bar for measuring angles, the comparator and a number of optical instruments. The interferometer, one of the optical type, was shown by photograph.

Organization Formed for Establishing Commercial Standards

ABOUT a year ago, the Commercial Standards Unit was created by the Division of Simplified Practice, United States Bureau of Standards, to aid those industrial and commercial groups desiring to establish standards of grade and quality for their products or their purchases, or to secure relief in instances where the current variety in grades, qualities, and specifications is a burden on the producer, and a handicap to the purchaser.

The Commercial Standards Unit does not intend to write specifications but will cooperate on request with any industry in finding among existing standards and specifications those which will satisfactorily meet the commercial needs of that industry. In the event such a standard is not to be found, the Unit will assist the industry to develop one.

A "commercial standard" has been defined as a standard

for a commodity which industry wants, that is, one which the manufacturers want to produce, which the distributors want to stock, and which the consumers want to buy.

The Commercial Standards Unit functions only at the direct request of the industry concerned. Its procedure follows that of the Division of Simplified Practice, except that 65 per cent of the industry, by volume of annual production, must accept the commercial standard in writing before it is published by the Department of Commerce. Provision is made for regular revision of the standard in order that it may be kept constantly compatible with progress in the art.

Among the projects now actively considered are commercial standards for malleable iron unions, brass pipe nipples and enameled sanitary ware.

Scrap Exports Reach Large Volume

More Going to Japan Than Canada—Southern Ports the Largest Shippers—Character of Material Exported— Situation in Other Countries

WASHINGTON, Oct. 23.—The unprecedented export movement of iron and steel scrap from the United States has created unusual interest among both domestic dealers and consumers. Ordinarily shipments of old material to world markets are so small that they have no effect on the market but, whether a mere coincidence or directly related, it has been observed that domestic prices of scrap have been rising with the growing exports.

Except for an occasional dip, exports of scrap have been increasing since March, 1927, when they were only 15,416 gross tons. In August of the present year they established a record with a total of 70,538 tons. For eight months ended August, 1927, scrap exports aggregated 145,700 tons, while for the corresponding period of this year they increased to 364,776 tons and for the 20 months, January, 1927, to August, 1928, inclusive, the formidable figure of 603,985 tons was reached.

Reasons Assigned for Large Exports

Several reasons are assigned for the rise in exports of scrap. Among them are:

- The disturbed situation in China, reducing shipments from that country of iron ore and pig iron.
- Shutting down of iron ore mines in Sweden as the result of recent strikes.
- Restrictions in Sweden against exports of scrap.
- Similar restrictions in France.
- Completing the recovery of scrap material from the battlefields of Europe.
- Diminishing supplies of scrap in Japan.

The unsettled situation in China together with its reduced domestic supplies of scrap have been important factors in forcing Japan to reach out for new sources of old material. Japan usually draws on China for iron ore and pig iron and to some extent on Sweden and India. Some of these sources are now entirely or almost completely cut off, with no indication that they will be available again soon. Sweden for some time has prohibited the exportation of scrap and only recently extended this proclamation until March, 1929.

France has in effect a limited prohibition against the exportation of scrap, whose shipments to Italy are restricted to a basis of trade in iron and steel with Italy. The result has been that Italy likewise has had to search for new sources of supply. The clearing of the battlefields of Europe of scrap is understood to be almost at an end and to have been a factor in forcing France to reduce exports of scrap. Germany has become a larger importer of scrap. Poland and Danzig also have been affected by export prohibitions and other causes which have reduced the supplies of scrap obtained from the usual sources. China has suffered from internal conditions and, while not a large user of old material, has been compelled to go outside for supplies.

Japan, Italy, Poland, Germany and China together took 254,835 tons, or a little more than 72 per cent of the scrap exports of 364,776 tons during the first eight months of 1928. For the corresponding period of last year scrap

exports to these five countries were 84,447 tons, or approximately 57 per cent of the total of 145,700 tons exported.

Japan Taking More Than Canada

The other large consuming buyer of American scrap is Canada, generally the leading user. But during the first eight months of the present year exports of scrap to that country, 101,987 tons, were about 6000 tons less than the 107,853 tons exported to Japan, which took first rank during that period. During the eight months ended with August of 1927, Canada took 56,885 tons while Japan took only 40,936 tons. From a point of percentage increase the most notable movement of sizable tonnages were to Poland and Danzig, which during the first eight months of the current year took 53,585 tons and it is assumed that this material was consumed in Poland. It is thought unlikely that it would have moved so far east and been transshipped to Germany. During the eight months ended with August of last year, scrap exports from the United States to Poland and Danzig were only 10,300 tons.

Mexico and the United Kingdom have figured to a smaller extent than the other countries named in receiving scrap from the United States and shipments to the Netherlands have fallen to a negligible quantity, as shown in one of the tables.

Taking the nine countries dealt with, exports of scrap from the United States during the first eight months of 1928 aggregated 362,290 tons, leaving only 2486 tons shipped to other countries. For the corresponding period of 1927 these nine countries took 144,519 tons out of the total exports of 145,700, other countries taking the remainder of 1181 tons.

Government records do not disclose the grades of scrap sharing in the export movement but, except for China, the leading countries of consumption are producers of steel in bulk quantities and from this fact it is indicated that the major portion of the old material exported is heavy melting steel. China uses scrap largely for the making of knives, forks, razor blades, wire shorts and for plate cutting purposes.

Most Scrap Goes from Southern Ports

Southern ports are the source of the largest shipments of scrap. Galveston led during the first eight months of 1928, clearances aggregating 75,296 tons for the nine principal consuming countries. For the corresponding period of last year shipments to these countries from Galveston amounted to 32,427 tons. Michigan was the next most important source of scrap shipments during the first eight months of the present year. This is accounted for by the fact that the bulk of scrap exports to Canada are cleared through Michigan. The total exports through that district to Sept. 1, this year, were 73,418 tons, of which 73,307 tons went to Canada. During the eight months ended August, 1927, exports from the Michigan district were 38,799 tons, of which Canada took 38,745 tons. Exports from Florida during the first eight months of 1928 totaled 32,566 tons, of

which 13,682 tons went to Japan, the second largest American port of shipment for that country, Galveston being first with 47,346 tons. During the eight months ended August, 1927, exports of scrap from Florida amounted to only 5520 tons.

Massachusetts ranked fourth as the source of exports during the eight months of 1928, supplying 32,127 tons, of which 24,078 tons went to Poland and Danzig. Exports

United States Exports of Iron and Steel Scrap by Principal Countries of Consumption—Gross Tons			
	Eight Months Ended August		Calendar Year 1927
	1928	1927	
Canada	101,987	56,885	92,514
Japan	107,853	40,936	71,087
Italy	68,539	28,158	30,185
Poland and Danzig..	53,585	10,300	14,858
Germany	18,843	2,216	9,367
China	6,015	2,937	4,067
Mexico	3,884	1,218	2,983
United Kingdom....	1,518	1,854	3,163
Netherlands	66	15	9,402
Total	362,290	144,519	237,626
All others.....	2,486	1,181	1,583
Grand total.....	364,776	145,700	239,209

from New Orleans during the eight months of the current year totaled 23,173 tons, of which 20,563 tons went to Italy. Of the 18,428 tons shipped from Maryland during the first eight months of 1928, Germany took 9171 tons, other ton-nages going to Poland and Danzig, 5679 tons; to China, 1937 tons, and to Japan, 1641 tons. Sabine, Tex., shipped 13,565 tons during the first eight months of the present year, 9894 tons going to Italy and 3640 tons to Poland and Danzig. Virginia shipments during the first eight months of 1928 aggregated 12,549 tons, of which 6761 tons went to Poland and Danzig and 5699 tons to Japan. Much of the scrap from the South is said to consist of railroad material as well as steel salvaged from old buildings which have been and are being razed.

The Situation in Poland

In connection with the situation in Poland the ore ex-tracted in that country is of low iron content and in 1927 is said to have averaged only 31 per cent, as against im-ported ore which averaged between 43 and 58 per cent. The practice of the Polish industry is to mix the domestic and foreign ores, but the quality of the pig iron is under-stood to have been unsatisfactory.

Output of iron ore in Poland, however, has increased. It rose to 538,706 tons in 1927 and 282,459 tons during the first five months of the current year, according to the Iron and Steel Division, Department of Commerce, which based its figures on reports from Consul Charles Heisler and Assistant Trade Commissioner Gilbert Redfern, War-saw. In 1926 production of iron ore in Poland was 316,073 tons.

Imports of iron ore into Poland also have been increas-ing, amounting to 94,593 tons during the first quarter of 1928 and 585,172 tons in 1927, as against 273,387 tons in 1926. Similarly, the imports of scrap have risen during these years and for the first half of the current year aggre-

United States Ports Shipping Scrap Material to Nine Chief Consuming Countries—Gross Tons			
	Eight Months Ended August		Calendar Year 1927
Ports	1928	1927	
Galveston	75,296	32,427	45,789
Michigan	73,418	38,799	62,879
Florida	32,566	5,520	7,280
Massachusetts	32,127	6,313	8,445
New Orleans	23,173	212	295
Maryland	18,428	3,250	15,458
Sabine, Texas.....	13,565	15,769	19,754
Virginia	12,549	6,197	10,791
Buffalo	10,575	10,850	18,306
Washington	10,487	4,420	7,682
Oregon	8,548	3,034	4,240
Vermont	5,356	1,887	9,175
San Antonio.....	5,170	664	2,216
Georgia	4,937	.....	.....
St. Lawrence.....	4,073	305	685
North Carolina....	3,923	.....	.....
Mobile	2,782	1	1
Rhode Island.....	2,621	.....	.....
Los Angeles	2,035	4,355	5,185
Porto Rico.....	1,965	.....	.....
New York	1,698	1,500	2,690
Hawaii	1,565	2,063	2,925

gated 250,037 tons and 471,582 tons in 1927, as compared with 162,903 tons in 1926.

The future of the scrap trade is problematical, as the German-Polish convention of June 15, 1922, the terms of which provided that Germany should furnish Poland with 235,000 tons of scrap annually for five years, terminated in June, 1927, and since that date the sales of German scrap in Poland have practically ceased. In consequence where imports formerly moved overland from Germany to the Polish steel works in Upper Silesia, the bulk of imported scrap now moves through the free city of Danzig with a long and costly haul before it can be delivered to the Silesian furnaces.

Directors and Officers of Youngstown Sheet & Tube Co.
at Indiana Harbor Plant



Front row: Left to right. All of these men are Directors: Richard Garlick, Harry Coulby, A. E. Adams, H. G. Dalton, President J. A. Campbell, John Tod, T. J. Bray, Assistant President Frank Purnell and J. W. Ford.
Middle Row: J. M. Faris, assistant to vice-president; L. A. Manchester, general counsel; W. C. Reilly, vice-president; W. E. Watson, vice-president; W. B. Gillies, district manager at Chicago; C. S. Robinson, vice-president; W. E. Meub, secretary and treasurer, and W. J. Morris, vice-president.
Last Row: C. J. Ohlson, consulting engineer; A. R. Finch, general superintendent, Chicago plant; Henrik Ovesen, chief engineer; and E. S. Stillman, assistant district manager, Chicago plant.

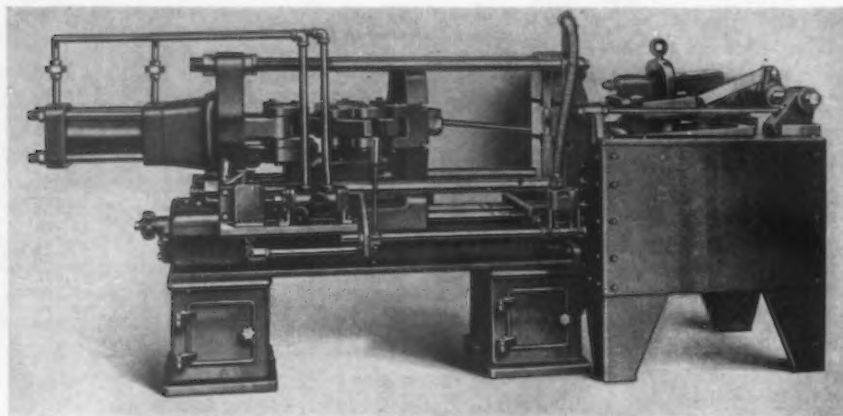
Makes Die Castings for High Outputs

AN improved type of Lester die-casting machine has been built for its makers, the P. & R. Tool Co., Inc., Worcester, Mass., by the Reed-Prentice Corporation of that city. The machine is designed for high production of die castings, with a capacity up to 250 shots per hour, producing casting from a fraction of an ounce up to 5 lb. in aluminum and in corresponding weights in other metals. To accomplish this the machine is semi-automatic in its operation. It

of the machines at maximum production.

The operation of the machine is simple, by means of two lever handles shown at the front, one, at the left, horizontal, the other vertical. The movement of the horizontal handle brings into action the die-closing mechanism. Simultaneously, the tapered gooseneck nozzle is forced forward into its similarly tapered seat at the aperture in the adjacent die.

The vertical lever controls the air,



By the Lever at the Left the Dies and Metal Connection Are Set and by the Lever at the Right Metal Is Forced by Air into the Dies

is furnished in four sizes, that shown being the smallest.

A chief change in the design from previous models lies in the mechanism which provides the automatic filling of the gooseneck which dips the molten metal from the furnace and delivers it under high air pressure into the dies. The die-closing toggle mechanism is hydraulically operated by oil and with a delivery of 3000 cu. in. of oil per minute will develop 15 cycles with a low consumption of power. The builders state that a 10-hp. motor will easily operate three

which forces the hot metal from the gooseneck into the dies to form the casting. The gooseneck is not connected with the high-pressure line when the dies are open, thus to eliminate danger or accident from this source.

The reverse action of the vertical lever throws off the air and the reverse action of the horizontal lever opens the dies. An ejector plate automatically removes the cooled casting and the cycle of operation is completed. The picture shows the machine without dies in place.

Micrometers for Measuring Forming Tools

TWO micrometers for checking the accuracy of forming tools have been brought out by the Brown & Sharpe Mfg. Co., Providence. One of the instruments, shown at the right in the illustration, is provided with ½-in. diameter disks on its anvil and spindle end to permit taking measurements in places inaccessible to regular micrometers. The disks are

1/16 in. thick in the center and 0.020 in. thick at the outer edge. The measurement of a form up to ½ in. deep and over 0.020 in. in width can be taken with this micrometer, which is furnished in one size for measuring 0 to 1 in., by thousandths of an inch.

The thin blade ends of the anvil and spindle of the micrometer caliper shown at the left in the illustration



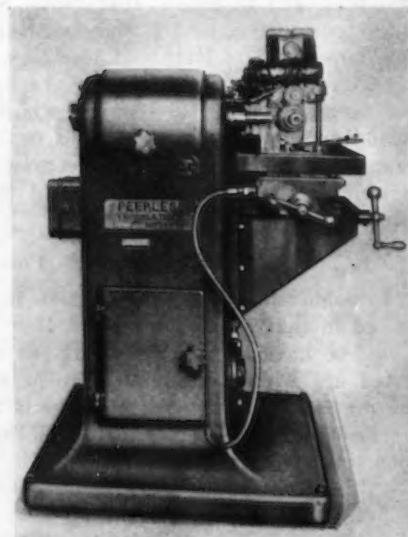
Accuracy of Forming Tools May Be Checked Conveniently

easily enter the narrow slots and grooves of the forming tools. The blades are 0.030 in. thick and permit measurements to be taken in slots or grooves up to 7/32 in. deep. By the use of this micrometer, the diameter of forming tools can be accurately measured and the depth of forms and grooves determined. It is available in sizes for measuring from 1 to 4½ in. by thousandths of an inch.

Chamfering Machine for Gear Teeth

FOR chamfering and rounding teeth of gears to promote easy engagement or meshing, as in the case of transmission gears in automobiles, the City Machine & Tool Works, 1517 East Third Street, Dayton, Ohio, has brought out a new Peerless tooth chamfering machine, motor-driven, with motor installed in the base.

The standard machine, such as that here shown, will accept gears up to 10 in. in diameter, although the capacity can be increased materially, it is emphasized, by slight alterations in manufacture. Operation time is put



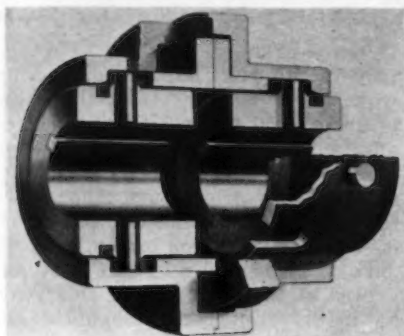
Peerless Gear-Tooth Chamfering Machine Has Inclosed Motor

at 45 teeth per minute, depending on the required pitch and form, although the makers say that greater speeds have been attained. Changing to gears of different sizes is a matter of a few minutes, and pitch change requires slightly longer time. The picture shows the set-up on rounding the corners of external teeth, but by a slight shift it can likewise be employed for rounding internal teeth. The machine is offered to work to close mechanical tolerances at speeds limited only by cutter endurance. Timken roller bearings are employed to assure smooth chatterless operation, and generous proportions are counted on to eliminate vibration.

The area of the base is 26 x 36 in., the overall height is 49½ in., and the net weight is 1800 lb.

Full-Floating Flexible Coupling

A NEW type of flexible coupling is announced by the T. L. Smith Co., Milwaukee. It is known as the Flex-Ring full-floating coupling and in design approaches the universal joint with a shock-absorbing member



Torsional Load Is Transmitted Through Ring Shaped Springs Made of Alloy Steel

added. It is claimed that it compensates for all possible conditions existing in a direct drive, such as angular misalignment of shafts, off-

set between shafts, end play of shafts and shock. The Flex-Ring is designed to handle these conditions even when present to an excessive degree.

Torsional load is transmitted through one or more ring-shaped springs made of alloy steel. It is said that these springs are not subjected to any wear from endwise motion of the shafts, nor from angular or offset misalignment, since they are confined in a housing eliminating all motion except opening and closing under stress. In a reversing drive it is not necessary to increase the size of the coupling, as there is no reversal of stresses in the torque elements.

The coupling has been used on compressors and other units since 1924. About a year ago the company gave it a severe test on one of its own boring mills where the shaft had an offset of 3/32 in. The test was continued throughout the year and at times the mill was purposely overloaded as high as 90 per cent. After a year's use under these extreme conditions, the Flex-Ring is said to be still in perfect condition.

Tilted Offset Milling Machine

TWO views are shown of a new 28-in. tilted offset miller, built by the Oesterlein Machine Co., Cincinnati. Its design incorporates the same general principles of offset milling as



Continuous Cutting Is a Feature of This Tilted Offset Miller

are used on the 48-in. machine. Relatively large cutters, completely surrounded with work, the two centers of which are offset from each other to obtain the proper depth of cut, form the basis around which the design of these machines has been developed.

Among advantages claimed for the machine is the fact that cutting is continuous—there is no returning to

starting point. Many parts are undercut at the same time. The feed automatically decreases in the bottom of the cut.

The 28-in. unit is intended for use on milling operations on screws and bolts, such as flattening the heads of connecting rod bolts, slotting screws, milling small clevises and yokes, sawing, and straddle and face milling of small parts. Because the production

on such work by the offset process is limited only by the number of parts an operator can handle, means are provided in the work-holding fixtures for automatically clamping, unclamping and ejecting the parts, thereby leaving the operator's entire time for loading. Such a fixture is illustrated.

Some of the features of the machine are as follows:

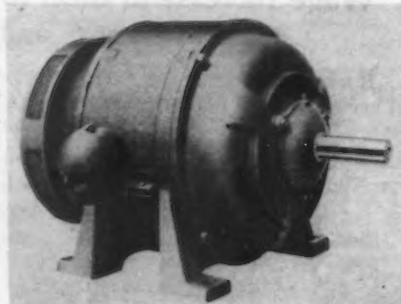
- Provision for the use of 20 gal. of coolant a minute,
- A large chip basin within the base,
- Frictionless bearings throughout, including spindle,
- Relatively care-free lubrication system,
- Heat-treated, multiple, splined gears and shafts throughout,
- Adaptability to the use of automatic fixtures.

The machine has an 18-in. diameter table, swings 28-in. diameter, allows 14 in. from table to outboard arbor bearing, uses 2 3/4-in. diameter arbor, weighs 2600 lb. net, and is driven by a 3-hp. 1800 r.p.m. motor mounted on the back of the machine, connected by chain with the driving sprocket.

Inclosed Electric Motor Fan Cooled

FULLY-INCLOSED fan-cooled induction motors are made by the Reliance Electric & Engineering Co., Cleveland. They are made in sizes of 1 1/2 hp. to 40 hp., but for the larger sizes a so-called skeleton frame motor is used, one of which is shown in the accompanying cut.

As is generally apprehended, motors of this type may be used in places subject to great quantities of mill dust and dirt, and at the same time may



be smaller than otherwise would be the case were measures not provided for the internal cooling of the motor parts, let alone keeping open the magnetic gaps within the motor.

A single exhaust fan is mounted on an extension of the shaft in the case of the Reliance construction outside the front bearing bracket. The external cooling air is drawn in through openings at the center of the back bearing bracket. The air passes over the radiating bonnets and stator and is exhausted at the front end, with the protection of heavy netting, as shown. For those desiring further particulars, the company has prepared a small catalog containing sectional drawings of both the skeleton frame and the riveted frame motor.

German Mills Threaten Wage Lockout

British Foresee Advantage from German Suspension—Welsh Tin Plate Mills Resume Output Restriction

(By Cable)

LONDON, ENGLAND, Oct. 22.

CLEVELAND pig iron is quiet as most of the output is going to local steel works and supplies for sale in the open market are limited. The threat of a lockout in Germany, early in November, is considered as a possible favorable development for British producers.

Stocks of hematite iron have almost all been absorbed and supplies for early delivery are expected to be scarce. Buyers are consequently endeavoring to cover their future requirements and output may be increased. Foreign ore is quiet as German consumers have covered most of next year's requirements.

Imports of steel into Britain are larger, but new buying is light. Finished iron and steel is unchanged. The shipbuilding industry continues depressed. The Clyde Shipbuilding Co. is closing its Port Glasgow yard and dismantling it. Day, Summers & Co. are closing their Southampton works. Lloyd's Register for the quarter ended in September reveals a decrease in British tonnage under

construction of 112,000 tons, compared with the end of the second quarter, and 447,000 tons compared with the third quarter of last year. Compared with the third quarter of 1927, Clyde shipbuilding declined 28 per cent and North East Coast building 47 per cent.

Tin plate is quiet. Welsh makers have agreed to increase the restriction of output for 13 weeks beginning at the end of November, to offset the shortage of orders for the rest of this year. All mills will close for three weeks during that period. Prices for forward delivery are firm, many makers having sold half their production for the first six months of 1929.

Galvanized sheets are quiet but prices are steady. Merchants have sold Japan thin-gage black sheets for November-December shipment.

Continental markets are quiet, with but little buying by British consumers and overseas markets and prices are consequently easier. The International Wire Rod Cartel meets in Luxemburg, Oct. 26, when it is expected that prices will be advanced and the cartel renewed for another six months from the end of December.

increase of 15 pf. per hr. The employers offered minor concessions, which would have increased the wages of about 2000 of the 225,000 workmen affected, but these proposals were refused. The Labor Unions will probably request arbitration, and under the law the Government has authority to make a decision binding on both parties. Steel wages were last advanced at the beginning of this year, but by only 2 pf. per hr. Should wages be increased materially, syndicate domestic prices will be advanced. At present prices are unchanged, but the syndicates show reserve in concluding new contracts for future delivery. A strike involving 50,000 workmen is in effect at North Sea and Baltic shipyards.

Domestic and export markets are quieter than at the beginning of the month. In September, for the first time since February, 1927, pig iron output was less than 1,000,000 tons. The percentage of production by Rhenish-Westphalian furnaces in the first three quarters of 1928 is but little less than the output in the same months of 1927, but there a sharp decline appears in the production of Silesia and of the Siegerland-Lahn-Dill districts. The total German pig iron production in the first nine months was 9,638,384 metric tons, compared with 9,694,106 tons in the same period of 1927. September output was 985,413 tons, compared with 1,104,653 tons in September, 1927. The number of furnaces in blast at the end of September was 99, against 116 at the beginning of the year. Domestic pig

German Lockout in November

Wage Increase in Steel Mills Refused but May Be Arbitrated—Export and Domestic Trade Quiet

BERLIN, GERMANY, Oct. 13.—Throughout the northwestern iron and steel industry notice has been posted

of a lockout effective Nov. 1. Employees have denounced the existing wage agreement, and demanded an

British and Continental European prices per gross ton, except where otherwise stated, f.o.b. makers' works with American equivalent figured at \$4.86 per £ as follows:

	£0	17 1/4 s.	\$4.31
Durham coke, del'd.....	1 2	to 1 2 1/2	5.35 to 5.48
Bilbao Rubio ore*.....	3 8 1/2	to 3 9 1/2	16.64 to 16.89
Cleveland No. 1 fdy.....	3 6		16.04
Cleveland No. 3 fdy.....	3 5		15.80
Cleveland No. 4 fdy.....	3 4 1/2		15.68
Cleveland No. 4 forge... 3 4 1/2			15.80
Cleveland basic (nom.).. 3 5			17.23
East Coast mixed..... 3 10			17.11
East Coast hematite.... 3 10 1/2			17.23
Rails, 60 lb. and up.... 7 15	to 8 5		37.66 to 40.10
Billets..... 6 2 1/2	to 6 10		29.77 to 31.59
Ferromanganese..... 13 15			66.83
Ferromanganese (export) 14 0			68.04
Sheet and tin plate bars, Welsh..... 6 0			29.16
Tin plate, base box..... 0 18	to 0 18 1/2		4.37 to 4.43
Black sheets, Japanese specifications..... 13 7 1/2			65.00
Ship plates..... 7 12 1/2	to 8 2 1/2		1.63 to 1.74
Boiler plates..... 9 0	to 10 10		1.92 to 2.25
Tees..... 8 2 1/2	to 8 12 1/2		1.74 to 1.84
Channels..... 7 7 1/2	to 7 17 1/2		1.58 to 1.69
Beams..... 7 2 1/2	to 7 12 1/2		1.53 to 1.63
Round bars, 3/4 to 3 in.. 7 10	to 8 0		1.62 to 1.69
Steel hoops..... 9 0	to 10 0		1.92 to 2.14
Black sheets, 24 gage.... 10 0			2.14
Galv. sheets, 24 gage.... 13 10	to 13 15		2.93 to 2.98
Cold rolled steel strip, 20 gage, nom..... 16 0			3.42

*Ex-ship, Tees, nominal.

Continental Prices All F.O.B. Channel Ports

	(Per Metric Ton)	
Foundry pig iron (a):		
Belgium.....	£3 3s. to £3 5s.	\$15.31 to \$15.80
France.....	3 3 to 3 5	15.31 to 15.80
Luxemburg.....	3 3 to 3 5	15.31 to 15.80
Basic pig iron (nom.):		
Belgium.....	3 3	15.31
France.....	3 3	15.31
Luxemburg.....	3 3	15.31
Coke.....	0 18	4.37
Billets:		
Belgium.....	5 1	24.54
France.....	5 1	24.54
Merchant bars:		
Belgium.....	6 2 1/2	1.35
France.....	6 2 1/2	1.35
Luxemburg.....	6 2 1/2	1.35
Joists (beams):		
Belgium.....	5 3	1.13
France.....	5 3	1.13
Luxemburg.....	5 3	1.13
Angles:		
Belgium.....	6 0	1.30
1/2-in. plate:		
Belgium (a).....	6 14	1.48
Germany (a).....	6 14	1.48
3/4-in. ship plate:		
Belgium.....	6 9	1.42
Luxemburg.....	6 9	1.42
Sheets, heavy:		
Belgium.....	6 1	1.33
Germany.....	6 1	1.33

(a) Nominal.

iron prices have been weaker, and less tonnage is going to foundry consumers. While pig iron in the international market has been firmer, there has been no reflection of this strength in Germany.

In semi-finished products the greatest domestic demand is for billets. The market for slabs is quiet. Sheet rolling mills report declining sales. Demand from the shipyards and from boiler manufacturers is smaller. Foreign buying of tubes has declined and producers are operating not more than 60 per cent of their capacity. The domestic market for bars has been quiet since the beginning of the month, so that German mills are able to execute export orders promptly and obtain slightly higher prices than other Continental producers. As much as £6 8s. per ton (1.41c. per lb.) f.o.b. is quoted today while in the fall of 1927 export bars sold at £4 12s. to £4 13s. (1.01c. to 1.02c. per lb.). Mills are now obtaining £1 15s. (\$8.50) per ton more for exports than a year ago, but domestic prices have advanced only 7 m. (\$1.67) per ton. The iron and steel foreign trade balance continues to improve.

The quarterly report for Sept. 30, of the Vereinigte Stahlwerke A. G., Dusseldorf, reports orders in hand at only 68.1 per cent of the volume of September, 1927. Output of coal, coke, pig iron and steel in the third quarter exceeded the second quarter.

A recent official inquiry into German mining as compared with before the war shows the total value of mine output in 1927 as 2,930,000,000 m., which is 39 per cent greater than in 1913 within the present frontiers. Even allowing for higher prices, 31.9 per cent for this group of commodities, the value exceeds the pre-war. Compared in tons, coal output in 1927 exceeded the pre-war by 9.1 per cent, lignite by 72.5 per cent. Iron ore output declined by 9.3 per cent and zinc output increased by 17.6 per cent.

German Tin Plate Mills Get British Orders

HAMBURG, GERMANY, Oct. 7.—The Welsh-American tin plate agreement has brought about a rather unusual situation in export trade. British exporters of tin plate in London, Manchester, Liverpool and Glasgow who are unable to supply their customers in foreign markets have sent numerous inquiries to German makers. German makers, who exported a total of 300 to 500 tons of tin plate a month prior to the war, have been shipping about 3000 tons monthly this year, and trial orders that they now have from British exporters are expected to increase this total considerably. In the past practically no German tin plate has been sold in South and Central American countries or in Canada, the German markets being the Scandinavian countries, Portugal and Italy. The trial orders from British exporters are for shipment to Canada and South American markets.

Tube Cartel Maintains High Prices

Consumers in Europe Object to High Domestic Market and Seek Pipe in Britain, Holland and United States

DÜSSELDORF, GERMANY, Oct. 4.—An example of what may occur when a combination of producers controls a product internationally is afforded by the International Tube Cartel. Domestic and export prices of tubes are fixed by the cartel in France, Belgium, Germany, Czechoslovakia, Luxembourg, Hungary, Poland and the Saar. Exports of tubes from one member country to another are not permitted by the association, so that domestic prices in these countries are maintained at a high level, despite complaints of consumers.

As an example of the high domestic prices that can be maintained by such an association of producers, the difference between the German domestic and export prices is at present 70 to 80 m. (\$16.66 to \$19.04) per ton, while in the bar market there is a difference of only 17 m. (\$4.05) per ton. Consumers, in charging that the high prices quoted by the tube makers are unjustified, cite a recent sale of tubes, totaling about 2,000,000 m. (\$476,000), made on reparations account to the French railroads by a small outsider, the Röhrenwerke at Bielefeld. The price of the seller was

30 per cent lower than the quotations of members of the association.

It was claimed by the tube cartel that the seller would undoubtedly incur a loss from this order unless inferior material were furnished. Tests of tubes delivered to the French railroads showed the material to be satisfactory, and, following the order, shares of the company advanced 20 per cent in the stock market.

There are two European countries not members of the tube cartel, Holland and Great Britain. Although British prices are high, Stewarts & Lloyds, Ltd., Glasgow, is disposing of substantial quantities of tubes through merchants in Cologne, and the Dutch works, Staalwerke de Maas, Maastricht, which started producing tubes in September, has established offices in Germany and is under-quoting the cartel. Merchants are inquiring for tubes from makers in the United States and, despite the tariff and high American prices, it is believed that the present level of the German tube market would permit business to be done with buyers at seaports, such as Hamburg, Bremen and Stettin.

Less Foreign Competition in Britain

Pig Iron More Active—Tin Plate Mills Full—Dock at Singapore Expected to Require Large Steel Tonnage

LONDON, ENGLAND, Oct. 12.—With the approach of winter, iron and steel makers are beginning to take stock of their position. Foreign competition has been curtailed to some extent by the recent upward movement in Continental prices, although there have been few reductions in British quotations. Rather, the tendency among British producers is to ask higher prices on most products.

Pig iron is slightly more active. It no longer pays to import foreign material, so that consumers have been paying more attention to domestic sources of supply. There is keen competition among the various producing districts. The Scottish Light Castings Association, at the beginning of this year, placed a substantial contract for foundry iron with Cleveland furnaces, but those producers, through their reluctance to make a concession in price, have lost the renewal of the contract, which has gone to Midland furnaces at about 2s. (48c.) less than the Cleveland figure.

Conditions in the hematite market are better. Export users are returning to the use of British material, and some desirable business has been placed for both domestic and overseas shipment. Stocks of hematite are still

fairly large, but they are being reduced, and if the present demand is maintained it will be necessary to blow in additional furnaces.

A considerable amount of activity has developed in semi-finished material, as a consequence of the high prices and extended deliveries ruling on Continental steel. Welsh sheet bar makers, in particular, have sold many thousands of tons to the tin plate mills and are now asking a 2s. 6d. (60c.) per ton advance for delivery next year.

The one weak spot in finished material is the heavy plate market. New shipping contracts are meager and there is practically no export demand. Consequently mills find it difficult to secure sufficient tonnage to enable them to operate more than part time. Current shipbuilding is fairly active and a good number of vessels have been launched recently, but the volume of new business will not replace the orders being completed.

Sheet and tube mills are moderately active, tin plate mills are assured of good business for next year, and in certain branches of construction and engineering work domestic demand will keep steel plants well occupied for several months. There are also some

important contracts for new bridges in foreign markets. The releasing of the Admiralty contract for the erection of the new Singapore Dock will result in the placing of large orders for reinforcing steel. Ordinary merchant business for export continues very quiet.

European Rail Prices Weaken

HAMBURG, GERMANY, Oct. 6.—Despite optimistic reports, the European Rail Makers' Association is said to be on the point of being dissolved. It is common knowledge among Continental producers that the British members have been selling a larger tonnage of rails than is specified in their allotment, at the same time opposing all efforts of the association at restriction. Consequently, some of the larger Continental mills in France and the Saar oppose continuation of the association.

Early dissolution is not expected, but evidence of lack of control over members is accumulating. Some rail producers, believed to be in France, Luxemburg and the Saar, are selling through merchants at £6 8s. 9d. to £6 9s. (\$31.29 to \$31.35) per ton, f.o.b. Antwerp, although the official selling price is £6 10s. (\$31.59) for Thomas steel rails. This is the first time in the two years of the association's existence that concessions from official prices have been reported. The rail association is the only all-inclusive syndicate of European and British producers.

British Government Buys Wire Abroad

HAMBURG, GERMANY, Oct. 6.—A contract for \$310,000 worth of telephone and telegraph wire has been placed by the British Postal Department with the German Wire Makers' Association. This is the second large wire order placed with a foreign maker by the British Postal Department, the first, totaling \$190,000, having gone to the Trefilerie du Havre in France last September. These are the first large orders placed abroad by this department since 1914, and the reason given is that British wire makers established a pool to maintain high prices for these contracts.

Foundry Equipment Orders Decline

Bookings of members of the Foundry Equipment Manufacturers Association declined in September, but were larger than for any other month this year except August and May. The index of both gross and net orders for 20 companies was 170, using average monthly shipments for the years 1922, 1923 and 1924 as a base of 100. The index of orders in August was 278. The index of shipments in September was 129.7, compared with 154.1 in August. Unfilled orders at the end of September stood at 529.7, compared with 467.2 a month previous.

To Discuss Machinery Trade Problems

Conference Called at Washington of Representatives of Machinery and Equipment Associations to Correct Uneconomic Practices

ON the request from secretaries of several of the associations in the machinery field, a conference of machinery and equipment trade associations was called by Hugh P. Baker, manager Trade Association Department, Chamber of Commerce of the United States. The meeting was held at Montauk Point, Long Island, N. Y., Sept. 29. E. F. DuBrul, general manager National Machine Tool Builders Association, was elected chairman, and Philip P. Gott, assistant manager Trade Association Department, Chamber of Commerce of the United States, was elected secretary of the conference.

Among the uneconomic practices discussed were the following: Wasteful buying; misrepresentation of materials; free engineering service; holding patterns for unlimited period; unlimited maintenance service.

A second conference has now been called for Thursday, Nov. 8, at 10 a.m., at the Chamber of Commerce of the United States Building, Washington, to give further consideration to the subjects of the first conference and also unfair competitive practices, unknown costs of doing business and obsolescence. W. H. Rastall, chief of Industrial Machinery Division of the Bureau of Foreign and Domestic Commerce, and H. C. Dunn, Domestic Commerce Division of the Department of Commerce, will outline further possible subjects which may be considered by this conference group.

The classifications and schedules which the Census Bureau will use in the special survey at Cleveland will be mailed to secretaries, and suggestions relative to these will be considered.

Those present at the first conference were as follows:

Harry Botsford, Society for the Development of Internal Combustion Power, Titusville, Pa.

J. R. Boyd, National Crushed Stone Association, Earle Building, Washington.

C. W. Conner, American Road Builders Association, 914 National Press Building, Washington.

C. R. Dimm, Flour Mill Machinery Manufacturers Association, care of Robinson Mfg. Co., Muncy, Pa.

E. F. DuBrul, National Machine Tool Builders Association, 826 Provident Bank Building, Cincinnati.

E. P. Essley, Associated Machine Tool Dealers, 551 Washington Boulevard, Chicago.

Charles M. Haskins, National Association of Waste Material Dealers, 1109 Times Building, New York.

W. S. Hays, Power Transmission Association, Drexel Building, Philadelphia.

C. E. LePage, American Society of Mechanical Engineers, 29 West Thirty-ninth Street, New York.

Verne E. Minich, American Foundry Equipment Co., 366 Madison Avenue, New York.

R. M. McClure, National Laundry Allied Trades Association, 111 West Washington Street, Chicago.

John W. Ogren, Elevator Manufacturers Association of the United States, 407 Conway Building, Chicago.

H. C. Dunn, Domestic Commerce Division, Department of Commerce, Washington.

R. M. Hudson, assistant director, Bureau of Standards, Washington.

W. H. Rastall, chief, Industrial Machinery Division, Bureau of Foreign and Domestic Commerce, Washington.

Philip P. Gott, assistant manager, Trade Association Department, Chamber of Commerce, Washington.

Mr. Rastall called attention to the fact that, according to the income tax report for 1924, 51.8 per cent of the firms reporting classified under "Machine, Tool and Metal Working Machinery" reported no profit.

Mr. Dunn pointed out that the changes in style constitute serious problems for the machinery industry. Do the machinery manufacturers and users realize, it was asked, that the life of a machine is not only determined by its productive ability but by the desire of the ultimate consumer to purchase the products of that particular machine. The Domestic Commerce Division upon request of the machinery industry may make a survey of the obsolescence of machinery.

Italian Ministry Suggests Closing Some Steel Plants

The Italian Ministry of Economy reports that the 60 steel and iron works in the country are producing at only about 50 per cent of their maximum capacity. The ministry suggests that the same tonnage of finished iron and steel could be produced at lower cost if half these works closed and only the largest and most modern continued operations.

Closing these plants would throw several thousand men out of work, but the consequent decrease in the cost of finished steel and iron, it is believed, would create employment for some 10,000 engineering workers.

The manufacturing interests of Italy are at present hampered by a heavy duty on foreign steel and iron, which forces up prices in Italy, and by Government pressure on employers to retain more workers than are necessary to meet present demands.

Half of Immigrants from Canada and Mexico

WASHINGTON, Oct. 20.—Immigrants admitted to the United States in August totaled 24,629, of whom 12,970 were males and 11,659 were females, according to the Bureau of Immigration. Emigrants leaving the United States in August were 6488, of whom 4062 were males and 2426 were females. Canada, with 6104, led in the number of emigrants to this country, followed by Mexico with 5557. From overseas, Germany contributed the largest number, 2782. The Irish Free State sent 1395; Italy, 1538; Great Britain, 1197, and the Scandinavian countries, 1302. Countries of eastern Europe sent 2264 immigrants.

Science Applied to Open-Hearth Practice

Pittsburgh Conference Listens to Exposition Made in Non-Technical Terms—Abnormal Steel Studied

PRACTICE sat at the feet of theory at the second open meeting of the Metallurgical Advisory Board to Carnegie Institute of Technology and the United States Bureau of Mines in Pittsburgh, Friday, Oct. 19, when Dr. C. H. Herty, Jr., physical chemist United States Bureau of Mines, gave a progress report on plant research on 40, 90 and 250-ton open-hearth furnaces. In the simplest language and by lantern slides remarkable for their clearness, he provided an entirely understandable explanation of the elimination of non-metallic inclusions from open-hearth steel. This report, easily the outstanding event of the gathering, showed how to determine whether a heat of steel was to be killed or reboiled. The author was commended further for having written something that the non-technical man of the open hearth might understand, particularly since so much that has been written previously has lost its effectiveness because the man in the shop cannot interpret, let alone apply it. Discussion by the 150 or more men present did not cease with the completion of the afternoon session, but extended informally throughout the dinner at the Pittsburgh Athletic Association.

Like the first open meeting held in Pittsburgh about a year ago, Friday's conference gathered a group of those interested in metallurgy from both a practical and an educational standpoint. As explained in *THE IRON AGE*, Oct. 27, 1927, page 1171, the metallurgical advisory board supervises a joint research activity. United States Bureau of Mines contributes one-half the cost of the work, while Carnegie Institute of Technology supplies one-third and the remainder is contributed by steel makers who will benefit by the results.

F. N. Speller, director of metallurgy and research National Tube Co., Pittsburgh, is the new chairman of the board, succeeding T. D. Lynch, consulting metallurgical engineer Westinghouse Electric & Mfg. Co., East Pittsburgh, who has filled that office for the past three years. G. A. Reinhardt, chief metallurgist Youngstown Sheet & Tube Co., Youngstown, Ohio, was elected vice-chairman, succeeding Dr. Earl Blough, technical director Aluminium, Limited, Pittsburgh.

In the morning Dr. V. N. Krivobok, associate, Bureau of Metallurgical Research, Carnegie Institute of Technology, presented an illustrated report on case carburizing research. He observed that it had been necessary to attack the problem from chemical and physical bases and determine the rate of diffusion and the distribution and size of non-metallic inclusions. He also reviewed effects of the different alloys upon the normality of the steel. Dr. H. W. Gillett, chief division of

metallurgy, United States Bureau of Standards, Washington, agreed with Dr. C. H. Herty, Jr., that oxygen has an important influence upon abnormality. He thought the plan of research was good, but warned that the problem was complex and the research likely to be long. M. A. Grossman, metallurgist Central Alloy Steel Corporation, Canton, Ohio, thought the way to the answer was in separating the variables, since the depth of the case is the same in normal as in abnormal steel.

Dr. F. M. Walters, Jr., director Bureau of Metallurgical Research, Carnegie Institute of Technology, mentioned the need of a pure manganese as a primary step in the study of steel and illustrated by lantern slides a furnace for making manganese metal 99.94 per cent pure, with the possibility of further refining to 99.99 per cent. This development will be described at length in a forthcoming issue.

Improved Uses of Coal and By-Products

A second international Conference on Bituminous Coal will be held at Carnegie Institute of Technology, Nov. 19 to 24. More than 100 speakers, representing 12 nations, will take part. Features on the program include:

Monday, Nov. 19. "Coal Problems in Perspective," by Lord Melchett (Sir Alfred Mond), London, England, and a session on low temperature distillation.

Tuesday, Nov. 20. "Coal, Hydrogen and Capital," by F. zur Nedden, Berlin, Germany, and a conference on pulverized fuel.

Wednesday, Nov. 21. "From Coal to Rubber," by Prof. Fritz Hofmann, Breslau, Germany, and a conference on purification and cleaning of coal.

Thursday, Nov. 22. Sessions on the liquefaction of coal and on combustion for power.

Friday, Nov. 23. "Some Thoughts of an Inventor on Scientific Research and Inventions," by Georges Claude, Paris, France, and conferences on gas.

Billings & Spencer Co. to Be Reorganized

The Billings & Spencer Co., Hartford, Conn., maker of drop forgings, tools and drop forging machinery, will soon submit to stockholders a plan for the reorganization of the company, contemplating the issuance of 105,000 shares of \$10 per value stock in substitution for present outstanding preferred and common stocks, the elimination of bonds with accrued interest and the payment of the company's outstanding bank loans. The plan has received the approval of directors and a syndicate of bankers has underwritten the proposed new stock issue.

David J. Post has been elected chairman of the board of the company, a newly created office. He has been a director in the Billings & Spencer Co.

for a number of years and is also chairman of the Hall-Thompson Co. and of Veeder-Root, Inc., both of Hartford. Other officers of the Billings & Spencer Co. are Frederic C. Billings, president and treasurer; A. H. Deute, vice-president and general manager, and C. T. Smith, secretary and assistant treasurer. Messrs Billings, Deute and Post and Richard J. Goodman, Edward Milligan, Lucius F. Robinson, Nelson Smith and L. Edmund Zacher will constitute the board of directors of the new company.

Pacific Coast Steel Interests Confer

More than 140 executives connected with the iron and steel industry in California met at the Hotel Whitcomb, San Francisco, Oct. 12, to attend the Northern California Regional Conference of the Iron, Steel and Allied Industries of California. Group meetings, representing merchant bar jobbers, steel mills, structural steel fabricators, foundries, general manufacturers and reinforcing steel bar jobbers, were held in the morning. Following a luncheon, resolutions affecting the industry on the Pacific Coast were presented to the executive committee for further consideration. The fifth annual conference will be held at Del Monte, Jan. 24 to 26.

Call to Meet on Shafting Standards

The sectional committee on the Standardization of Shafting will hold a meeting at the headquarters of the American Society of Mechanical Engineers, New York, Oct. 31, at 10 a.m., to consider the revision of certain standards developed by the committee some time ago. The proposed American Standard Woodruff Key dimensions which has recently been approved by the sub-committee will be considered. At this time eleven national organizations have been requested to appoint an official representative to serve on this sectional committee.

Plant to Make Carboly Cutting Tools

Carboly Co., Inc., is reported to be planning the construction of a new plant at or near Schenectady, N. Y., for the manufacture of metal and carbide alloys, to cost more than \$150,000 with equipment. The company was formed recently with a capital of 7000 shares of stock, no par value, by P. R. Mallory and interests identified with General Electric Co. Mr. Mallory is head of P. R. Mallory & Co., Inc., 350 Madison Avenue, New York, manufacturer of tungsten products, with plant at Port Chester, N. Y. Carboly is the trade name of a new tool material featured at the Steel Treathers' Exposition in Philadelphia earlier in the month, and described in the last issue of *THE IRON AGE*.

New Card of Extras on Hot-Rolled Strip

The Sharon Steel Hoop Co., Sharon, Pa., has announced a new card of extras on hot-rolled strip steel. As nearly all contracts for the fourth quarter have been closed on the old basis, the new extras, though immediately effective, probably will not apply to much tonnage until the first quarter of 1929. The company states that the extras are the result of more than a year's study of production costs of various widths and gages.

"In the card which has been in general use for some years," says the company, "the extras on the quite narrow sizes were so low in relation to costs as to make it unavoidable that a high base price be quoted to secure any profit on these small, light sections. On the wide sizes, the old card was thought to be consistent with mill practice of some years ago, when it was difficult, and, in some cases, impossible to roll wide sizes in light gages. All wide sizes in the usual strip gages were then expensive and troublesome to roll and therefore took high extras. Today's practice is such that large numbers of mills produce the wide sections much more economically than formerly, so that practically no regard has been given to the list of extras on the wide sizes. These practices have caused confusion and demoralization, and have, to a great extent, destroyed the usefulness of the old card.

"Our new card of extras, we believe, will overcome these difficulties and will be to the advantage of both buyer and seller in permitting a uniform base price to be built up under the new card of extras. If this should be

the result, it will permit the trade to have the same knowledge of the market situation as to strips as now pertains to bars, plates and other standard hot-rolled steel products."

The old card of extras failed to take into consideration the pickling costs on all sizes 1½ in. and wider. The new card has three divisions of pickling extras, one on sizes under 1½ in., another on sizes from 1½ in. to 6 in. and a third on 6 1/16 in. to 24 in.

It is said that other manufacturers are preparing to adopt the same card.

National Advertising for Steel Advocated

"The steel industry is the only large and important industry that has failed to seek the benefits of a national advertising campaign to educate the public as to merits and advantages of steel," said Charles F. Abbott, executive director American Institute of Steel Construction, in an address on Oct. 16 to the Advertising Club of Washington. "Unfortunately, there are a few leaders of this industry who still seemingly refuse to believe that advertising pays.

"It is to be hoped," he said, "that the time is not far distant when the steel industry may undertake a national advertising campaign to promote public education as to steel. No investment could be made offering greater opportunities for profit than that of a properly conducted national advertising campaign to win public support and thereby extend the consumption of steel, particularly in bridges and buildings, where public influence is frequently evident.

"The industry which grasps the full meaning of the new form of competition and adapts its policies to meet it will inevitably outstrip those which are unable to recognize the change that confronts them, or which fails to place the proper valuation on public opinion as the controlling factor in industrial progress."

Sheet Sales in September 370,936 Gross Tons

Sales of steel sheets showed a sharp gain in September and were greater than during any previous month of the year except March, according to the monthly report of the National Association of Flat Rolled Steel Manufacturers, Cleveland. Sales in September were 370,936 gross tons, compared with 254,397 tons in August. Production last month amounted to 318,907 tons and shipments were 322,876 tons, both falling off slightly from the previous month. Unfilled orders, which on Oct. 1 amounted to 539,960 tons, showed a gain of 40,000 tons over those of Sept. 1. The September report and comparisons follow:

	Sept.	Aug.	July
Total number of mills	721	721	721
Capacity per month	450,500	506,000	464,422
Percentage reporting	70.1	70.1	70.1
Sales	370,936	254,397	333,357
Production	318,907	329,396	267,685
Shipments	322,876	324,691	278,310
Unfilled orders	539,960	498,023	550,468
Unshipped orders	102,313	102,825	106,653
Unsold stocks	44,519	51,636	55,280
Percentages to Capacity			
Sales	117.5	71.7	102.4
Production	101.0	92.8	82.2
Shipments	102.2	91.5	85.5
Unfilled orders	171.0	140.4	169.1
Unshipped orders	32.4	29.0	32.8
Unsold stocks	14.1	14.6	17.0

New Card of Extras on Hot-Rolled Strip Steel Proposed by Sharon Steel Hoop Co.

B. W. Gauge No.	Thickness	WIDTH																Extra for Pickling	B. W. Gauge No.
		3/8"	7/8"	1"	1 1/8"	1 1/4"	1 1/2"	1 3/4"	1 7/8"	2"	2 1/4"	2 1/2"	2 3/4"	3"	3 1/4"	3 1/2"	3 3/4"		
3/16"	.187"	1.50	1.30	1.00	.85	.70	.55	.45	.30	.25	.20	.20	.10	.10	.10	.10	.10	.25	3/16"
7	.190-.180	1.50	1.30	1.00	.85	.70	.55	.45	.30	.25	.20	.20	.10	.10	.10	.10	.10	.25	7
8	.179-.162	1.50	1.30	1.00	.85	.70	.55	.45	.30	.25	.20	.20	.10	.10	.10	.10	.10	.25	8
9	.161-.146	1.50	1.30	1.00	.85	.70	.55	.45	.30	.25	.20	.20	.10	.10	.10	.10	.10	.25	9
10	.145-.132	1.60	1.40	1.05	.90	.75	.60	.50	.40	.30	.25	.25	.15	.15	.15	.15	.15	.25	10
1 8"	.125	1.60	1.40	1.05	.90	.75	.60	.50	.40	.30	.25	.25	.15	.15	.15	.15	.15	.25	1 8"
11	.131-.118	1.60	1.40	1.05	.90	.75	.60	.50	.40	.30	.25	.25	.15	.15	.15	.15	.15	.25	11
12	.117-.105	1.70	1.50	1.15	.95	.80	.65	.55	.45	.35	.30	.30	.20	.20	.20	.20	.20	.25	12
13	.104-.090	1.80	1.60	1.20	1.00	.85	.70	.60	.55	.40	.35	.35	.25	.25	.25	.25	.25	.25	13
14	.089-.076	2.00	1.70	1.30	1.05	.90	.75	.65	.55	.40	.35	.35	.30	.30	.30	.30	.30	.25	14
15	.075-.068	2.20	1.80	1.40	1.10	.95	.80	.70	.55	.40	.35	.35	.30	.30	.35	.35	.35	.25	15
16	.067-.061	2.40	2.00	1.50	1.20	1.00	.85	.75	.60	.45	.40	.40	.40	.40	.45	.45	.40	.25	16
17	.060-.054	2.60	2.20	1.70	1.30	1.10	.90	.80	.60	.50	.45	.45	.45	.55	.60	.60	.60	.25	17
18	.053-.047	2.90	2.40	1.90	1.50	1.20	1.00	.85	.70	.55	.55	.55	.60	.70	.80	.80	.75	.25	18
19	.046-.041		2.70	2.10	1.70	1.40	1.10	.90	.80	.65	.70	.70	.75	.80	.95	1.00		.25	19
20	.040-.035		2.30	1.90	1.60	1.30	1.00	.90	.85	.90	.95	1.00	1.05	1.15	1.20			.25	20
21	.034-.032		2.70	2.30	1.90	1.50	1.20	1.10	1.10									.25	21
22	.031-.028		3.20	2.70	2.30	1.80	1.50	1.40	1.40									.25	22
23	.027-.025				3.20	2.70	2.20	1.80	1.60	1.60								.25	23

QUANTITY EXTRAS
Less than 2000 lbs. but not less than 1000 lbs. of one size 25c per 100 lbs.
Less than 1000 lbs. of one size 50c per 100 lbs.

CUTTING EXTRAS

	2000 lbs. or more	Under 2000 lbs. to 1500 lbs.	Under 1500 lbs. to 1000 lbs.	Under 1000 lbs. to 500 lbs.	Under 500 lbs.
Cutting to lengths of 60" and over with pieces.....	No charge				.60
Cutting to lengths over 48" to 59" inclusive.....	.10	.20	.30	.50	.70
Cutting to lengths over 24" to 48" inclusive.....	.15	.25	.35	.55	.75
Cutting to lengths over 12" to 24" inclusive.....	.30	.40	.50	.70	.90
Cutting to lengths over 60" without end pieces.....	10% Extra per 100 lbs.				

Extras for galvanizing and flaring will be quoted on application. Extras for higher than .20% carbon will be quoted on application. Subject to change without notice.

Urges Distributers to Extend Sheet Uses

Metal Branch of American Hardware Association Hears Favorable Reports on Progress of Simplification

THE opportunity offered distributers to extend the use of sheet steel products was emphasized by George H. Charls, president National Association of Flat Rolled Steel Manufacturers, Cleveland, in an address before the Metal Branch, National Hardware Association, meeting at Atlantic City, N. J., Oct. 16. Mr. Charls dealt at length with the future possibilities of sheet steel and told of the work being done by the Sheet Steel Trade Extension Institute to bring out these potentialities. The distributer, he pointed out, is in a splendid position to realize considerable profits by following up the work already done and helping to broaden the market for sheet products. A considerable part of the increase in sheet steel consumption is already being taken up by demands from new sources and this, according to Mr. Charls, is only demonstrative of what may follow if the work is continued.

Market Conditions Good

B. C. McMahon, Bethlehem Steel Co., Bethlehem, Pa., spoke briefly on market conditions throughout the steel industry with special emphasis on sheets and tin plate. Although there has been a slackening in the demand for tin plate in recent weeks, he stated that the storm in Florida and the West Indies would occasion a considerable decrease in the pack of canned goods this season and probably lead to a very heavy pack in 1929, thus pointing to a good year for tin plate.

Discussing conditions in the sheet industry, he said that prospects looked better now than had been the case for several months. Mills are running at a high rate and deliveries have been extended. Prices, which until now, have been the most unfavorable factor in the industry, have improved somewhat, but there is still room for considerable advance. Distributers, he emphasized, are very important factors in sheet consumption, particularly of the galvanized product, and will continue to grow more important as the uses of this product grow more diversified. In spite of low prices, however, he said that the steel industry has kept wages at a high level, the average weekly pay envelope for the industry as a whole averaging \$33.87, as compared with \$27.30 for a group of 20 other important industries.

Reports Progress in Roofing Simplification

In the report of the sheet steel simplification board of review, W. L. Latta, Wheeling Steel Corporation, Wheeling, W. Va., chairman, stated that the Department of Commerce schedule No. 28, referring to sheet

steel had been reaffirmed and that schedule No. 78 on galvanized roofing had been improved upon. A representative of the Department, who was present at the meeting, stated that over 94 per cent of the manufacturers of sheet steel now adhered to the standard sizes specified.

Louis Kuehn, Milwaukee Corrugating Co., Milwaukee, presenting the report of the eaves trough and conductor pipe board, stated that the association had been successful in securing the adoption of 28 gage and heavier as the minimum weight for eaves trough. He stated that 96 per cent of the distributers in the country had adopted this standard.

The protest of the distributers to the lower discounts on sheets recently adopted by the mills was discussed in THE IRON AGE last week, page 970.

Plans for Third World Foundry Congress

During the past winter the committee on international relations of the American Foundrymen's Association has been engaged mainly on preliminary arrangements for the third International Foundrymen's Congress which will be held in London, June 11-15, 1929, under the auspices of the Institute of British Foundrymen. The first international congress was held in Paris in September, 1923; the second was held in Detroit in September, 1926.

Officials of the Institute of British Foundrymen will be hosts to the 1929 congress. Plans which have been agreed upon provide for the American delegation leaving New York either May 11 or 15, 1929, in order to arrive in England in time for a three weeks' sight-seeing pre-convention tour of England and Scotland, which will include several days in London prior to the opening of the congress on June 11. Important British foundry centers will be visited.

At an early date Thomas Cook & Son, the official travel agent of the tours, will submit a recapitulation of the pre-convention and post-convention trips for the committee's final approval and when approved it will be submitted to the A. F. A. members. If, in the meantime, anyone desires further information as to accommodations, rates, etc., he should write to Thomas Cook & Son, 585 Fifth Avenue, New York.

During the week of the congress itself in London what is expected to be the largest exhibition of foundry and shop equipment ever held in Europe will be staged under the auspices of the British foundrymen's organization. At the sessions of the congress papers will be read and discussed by the

world's most prominent foundrymen.

Since the announcement of the tour at the Philadelphia convention of the American Foundrymen's Association, a surprisingly large number of foundrymen have made inquiry as to details regarding the tour, indicating that marked interest is being displayed. Accommodations will be limited, especially for the pre-convention tour of Great Britain.

Awards to Hoover the John Fritz Medal

The John Fritz gold medal, the highest honor bestowed by the engineering profession of this country, has been awarded for 1929 to Herbert Clark Hoover, it is announced by the Engineering Foundation, 29 West Thirty-ninth Street, New York.

"The choice of Mr. Hoover," according to the announcement by Alfred D. Flinn, director of the foundation, "ended a process of selection begun a few years ago. The award was tentatively made a year ago by the John Fritz Medal Board, which is composed of 16 recent past presidents of the four national societies of civil, mining and metallurgical, mechanical, and electrical engineers, having together a membership of nearly 60,000. By this award, which was unanimous, the board sought to express the high appreciation of Mr. Hoover's professional brethren for his distinguished attainments as an engineer, particularly in mining operations in this and other countries, and his great services as a man to his fellows.

"Notable among his engineering achievements are the successful introduction into other countries of improved American mining methods. His scholarly accomplishments are also worthy of mention, especially his translation into readable English from difficult mediaeval Latin of Agricola's famous book 'De Re Metallica.' Mrs. Hoover was associated with him in this enterprise, which occupied 'leisure' hours at one period some years ago."

The citation accompanying the award reads: "To Herbert Hoover, engineer, scholar, organizer of relief to war stricken peoples, public servant."

Plans Study of Wire Rope

A research into the causes of breakdown in wire rope is being organized by a committee of American Society of Mechanical Engineers, jointly with Engineering Foundation. It is planned to construct a testing machine which can reproduce all the varied service conditions to which such rope is subjected. The society would be glad to hear from technical men particularly interested in any phase of the manufacture or use of wire rope.

Fluorspar Duty Increased 50 Per Cent

President's Proclamation Follows Investigation by Tariff Commission, Raising Import to \$8.40 Per Gross Ton

WASHINGTON, Oct. 23.—Increased by 50 per cent, from \$5.60 to \$8.40 per gross ton, by a Presidential proclamation of Oct. 17, the new duty on metallurgical fluorspar becomes effective Nov. 16. It affects only spar containing not more than 93 per cent of calcium fluoride, embracing grades used by the steel and foundry industries, but does not affect the acid and ceramic grades whose costs of production could not be adequately obtained by the Tariff Commission. The commission conducted the inquiry upon application of domestic producers of spar for a 50 per cent increase in the duty through the flexible provision of section 315 of the tariff act. The increased duty, as proclaimed by President Coolidge, is stated in terms of the gross ton because it is the accepted legal unit. Stated in net tons, the increase is from \$5 to \$7.50. The cost report was based on conditions in 1925.

The commission said that the rate of duty shown by the difference in costs of production of spar of the metallurgical grades, containing not more than 93 per cent calcium fluoride, in the United States and the principal competing country (England) necessary to equalize the differences within the limit provided in section 315 is the rate of \$8.40 per long ton, equivalent to \$7.50 per net ton. The report found that the total cost of production in 1925, including transportation to Philadelphia, was \$28.14 for domestic metallurgical spar and \$12.10 for English spar, a difference of \$16.04, while the total cost with transportation to Pittsburgh was found to be \$25.89 for domestic spar and \$15.76 for English spar, a difference of \$10.13. The Pittsburgh district consumes roughly 50 per cent of the fluorspar used in this country, while the Philadelphia district consumes approximately 10 per cent. About 10 per cent of the Pittsburgh consumption is foreign material and the remainder is domestic. Virtually all of the spar used in the Philadelphia district is imported. The latter district is the principal port of entry and the principal market in the United States for imported spar.

The commission said that the present duty of \$5.60 per gross ton does not equalize the difference in costs of production of fluorspar in the United States and England. The difference in costs of production of spar of the metallurgical grades in the United States and in England, it was stated, are greater than the amount of the present duty increased by the total maximum increase authorized under section 315, irrespective of whether the cost comparison is limited to factory costs of production or includes transportation costs to Philadelphia and Pittsburgh.

Costs of production were not ob-

tained by the commission from foreign producers because access to cost records was denied. The report said it was assumed that, in the absence of evidence to the contrary, the cost of production of imported spar is not more than the wholesale foreign price or value as shown by invoices. Invoices of imports in 1925, 1926 and the first half of 1927 were analyzed to ascertain the price of imported spar at foreign plants, the cost of shipment to ports in the United States and the grade of fluorspar shipped. While England was found to be the chief competing country in 1925, Germany was the principal source of spar imports in 1927, supplying 31,829 tons, or 45 per cent of the total, against 18,449 tons, or 26 per cent, from the United Kingdom.

In appearing at the hearing in July of last year on the fluorspar inquiry, Vice-President C. A. Buck of the Bethlehem Steel Co., who protested against an increase in the duty, estimated that his company consumes 80 per cent of the fluorspar imported. It does not use domestic spar because the foreign material can be obtained more cheaply. Mr. Buck attacked the cost figures of the commission in its preliminary report and said that, in considering the costs of producing in England, there was no account of the cost of depreciation, capital investment of plants and related items. He also contended that English spar was largely a reclaimed product from lead mines, but that these stocks are becoming exhausted, after which the English operators will have to resort to deep mining of fluorspar as is done in the United States.

Bethlehem Asked for Lower Duty

Mr. Buck further contended that an increase in duty would be a source of discrimination against the steel industry in the East because the industry in the West consumes domestic spar and would not be adversely affected by a higher duty. It was stated by Mr. Buck that the Bethlehem Steel Co. consumed 33,000 tons of fluorspar in 1926 and that if, as suggested by domestic producers, an increase of 50 per cent in the duty would mean only 20c. a ton additional in the cost of producing steel, the increase to the Bethlehem company alone would be \$82,500 a year. Mr. Buck also contended that it is not the intention of the tariff act that the costs of high-cost domestic producers shall be equalized with foreign production costs by levying heavy import duties or even that an average domestic cost "which has been unduly inflated because of the high costs of a few small producers should be used for the purpose of comparison." Mr. Buck said that even if the duty were increased it would make no difference in the source of Bethlehem's supply

because the imported material would still have to be relied on rather than domestic material, which, it was argued, could not reach the Eastern markets on account of the freight differentials. Mr. Buck had asked that the duty be reduced by at least \$1.71 per ton, which was declared to be the difference in the cost of the domestic product and the English product laid down at Pittsburgh in favor of the American spar.

Domestic Fluorspar Mines Aided by Tariff Increase

One result of the recent action by President Coolidge in approving an increase of 50 per cent in the import duty on foreign fluorspar is that the Hillside Fluorspar Mines will immediately begin the construction of a loading dock on the Mississippi River at Rosiclare, Ill. The company for some time has had plans and specifications ready for this dock, but has delayed starting the work pending the decision just made by the President under the authority granted him by the present tariff law. With the completion of the new dock, the company will be able to serve by river shipments its customers who are able to take shipments that way and that means all of the large steel companies in the Wheeling and Pittsburgh districts, all of which are located on the Ohio, Monongahela and Allegheny Rivers.

Another large fluorspar company for some time has been using the rivers in supplying its Pittsburgh district customers, and the saving in the delivered price to consumers has been about \$2 a ton when the barges of commercial towing companies have been used, and even more when the steel companies have allowed the use of their own barges, returning without cargo.

Between the added impost on foreign fluorspar and the lower delivered charges made possible by river deliveries, the domestic producers should now be able to operate their mines at a profit, a condition that was not possible when the imported product had a substantial delivered price advantage over domestic fluorspar at consuming points as far west as Pittsburgh and Wheeling. Figuring domestic gravel fluorspar at \$17 per net ton at mines, and a river barge rate of \$3 from southern Illinois to Pittsburgh, and handling charges of 50c. per ton, the delivered cost would be \$20.50. Assuming the addition of the full increase of \$2.50 a net ton in the import duty to the present price of foreign gravel fluorspar of \$16, the price would be \$18.50, Atlantic seaboard, to which would have to be added \$3.13 to \$3, the rail freight to the Pittsburgh district, a total of \$21.65 to \$22.07 per net ton. This advantage for American producers exists, however, if delivery is made by water, as the all-rail rate from domestic mines to the Pittsburgh district is \$5.25 per net ton, producing a delivered price based on \$17 at mines of \$22.25.

This Issue in Brief

Don't limit your interests to shop matters, Department of Commerce representative tells industrial engineers. Savings made by production economies may be wiped away by changes forced on business by new conditions. Engineers should study the broad trends of business.—Page 1028.

* * *

Are we wasting money on super-accuracy? As much waste results from needless super-accuracy as from undue inaccuracy, says speaker at industrial engineers' meeting. Warns manufacturers against paying for greater accuracy than the work warrants.—Page 1031.

* * *

Purchasing agents have greater influence upon national prosperity than any other group of operators, says Truscon official. Buyers are not to blame for attempting to eliminate "prosperity margin" on purchases. Sales managers should refuse to furnish goods at less than true value.—Page 1023.

* * *

Finds it does not pay to make all kinds of bolts and nuts on automatic machinery. "Slow sellers" are not made in sufficient quantities to justify the expense of designing and installing special machinery. In these cases semi-automatic or even hand-operated machines are the most economical.—Page 1016.

* * *

Surest way to invite price competition is to refuse to consider a competitor. Competitors should confer and discuss openly their opinions, handicaps and progress, says building equipment manufacturer. Contact and understanding between competitors is essential in properly sizing up the buyer's arguments.—Page 1023.

Age-hardening after cold-drawing is due to carbon. Carbon-free iron is not subject to aging. Phenomenon of age-hardening may be due to the reduced solubility of carbon and iron oxide in ferrite, caused by distorted crystals.—Page 1014.

* * *

Prevent segregation of blast furnace charge by depositing material on the stock line rapidly and lessening the drop. Increasing the bell drop and the angle of the bell will help accomplish this.—Page 1014.

* * *

"Dangerous shortage report" warns material supervisor that stock of a certain part is running low. One person in each department of automotive plant is designated to watch the stock.—Page 1013.

* * *

Good welders produce uniformly good welds, tests reveal. Steel fabricator finds that work of good welders does not vary 10 per cent. The same applies to the poor welders, but there is a considerable difference between the best work of the good man and the worst work of the poor workman.—Page 1026.

* * *

Welding of steel structures will not result in worth-while economies if buildings are designed for riveting and then welding substituted, says welding machine builder. Shop and erection costs would then be of the same order.—Page 1027.

* * *

Automobile output for fourth quarter expected to break all records. No major recession is in sight. Detroit employment barometer has again turned upward and is 50 per cent higher than it was a year ago.—Page 1062.

We could well afford to forget production costs and focus all our energies on distribution problem, says Department of Commerce executive. Savings made in distribution add just as much to annual profits as do production economies, and ought to be easier to make.—Page 1029.

* * *

Great upturn in scrap exports arouses attention of consumers. Exports for first eight months of 1928 were 2½ times those of same period of last year. August, 1928, established a record, at 70,538 tons.—Page 1032.

* * *

"Buying a market" is oftentimes an expensive procedure. Some manufacturers fail to recognize that the fact that a certain product is successfully marketed by one company does not mean that any group can derive profits from the same field.—Page 1023.

* * *

Bases purchase orders on sales forecasts. Purchasing department of automobile plant solicits bids and places contracts for estimated requirements for 12 months. Shipping orders are then placed at intervals during the year.—Page 1010.

* * *

Using salesmen for mass selling is wasteful. Advertising can do this more economically, says building equipment manufacturer, for it conserves the salesmen's time by serving as an introduction.—Page 1022.

* * *

Sales expansion gained through price-cutting is deceptive. No matter what the gain, it would be better if the same brain power were placed back of constructive distribution, says manufacturer.—Page 1023.

A. I. FINDLEY
Editor

THE IRON AGE

W. W. MACON
Managing Editor

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The Cost of Noise

AMERICAN workmen seem to be deaf to industrial noises; it might almost be said that Americans are deafened by industrial noises. The roar of rapid and powerful machinery, the clanking of hammers and presses, the grinding of gears (still with us), the puffing of engines and the whistling of exhausts, the ringing of bells and shrieking of sirens—all rise into a crescendo so characteristic of industrialism that the modernist composes "music" to its rhythm. We tolerate this bedlam despite the fact that we all avoid mechanical noises in the home, and pay premiums for silent vacuum sweepers, refrigerators, and household appliances, and judge a motor car by its quiet passing. Even though we search for economies in manufacture, we endure violent noises, every one of which represents waste. Would not an efficiency engineer be lost in a factory, which though busy was quiet?

Perhaps the construction operations in our big cities are no guiltier than other branches of industry elsewhere, but they do seem to proceed with utmost disregard for ear-drums—and some of it seems avoidable. Popular opinion and local ordinances have long since demanded mufflers on gas engines, yet an excavator thinks nothing of parking an air compressor alongside the curb, cranking it up, and when it is not blowing off into the throbbing atmosphere, it is pumping air into pneumatic concrete breakers peppering away like so many machine guns.

Such unnecessary noise is doubtless costly. Street railroads, which have been constant offenders, are beginning to realize this. For instance, car noises in San Francisco are being reduced by more precisely cut gear teeth, and the amplification of such clatter as yet remains is prevented by lead rings inside the gears, sound-absorbing fabric in the car floors, and rubber pads between trucks, bolsters and bodies. Crossings are made of one-piece steel castings, and the wheels ride over on their flanges. This prevents battering at the slots cut in the rail heads; noise is further reduced by imbedding the entire track layout in solid asphalt. The public service company reports that this type of crossing not only prevents resonance from the pavement, and avoids shocks passing through to adjacent buildings, but also is much more economical to maintain and presents a smoother roadway for other vehicles. It is also to be expected that less noisy vibration in the rolling stock will result in lower repair bills.

The cost of construction rackets in big cities is less easy to estimate. But if anyone thinks it is of no importance, let him ask a hotel proprietor alongside an extensive building operation! At the American Welding Society meeting recently it was stated that at least 50 rooms in a Philadelphia hotel had been practically

uninhabitable for nearly a year on account of the noises from adjacent subway and building construction. This represents a loss of approximately \$100,000 income to this one proprietor!

Silent construction is emphasized for welded structural steel erection. For example, as described on another page of this issue, a 12-story hotel at Hot Springs, Ark., was built between two similar structures without the resounding clatter of rivetting guns, and the extra cost of \$8 per ton was undoubtedly justified. The erector said the only improvements he could now suggest would be quiet gears on the hoists and lead faces on the erectors' mauls!

Whether welded erection is inherently more costly than rivetted joints may be questioned. Again, it may be true that the compressed air industry may be able to develop a silent squeezer, portable enough for erection purposes. At any rate, it should be a matter of congratulation that so young a process can compete at no greater a handicap with one which is entrenched behind years of engineering practice and trade union domination. When steel designers work out connection details which can be bolted up adequately and easily, yet provide for the necessary welding in the "down" position; when a sufficient number of trained welders is available; when inspectors and building codes understand and provide for the new method, it may be expected that the overall cost of silent erection will decrease.

Our philosophy is that the best is always cheapest. If welded erection is really a better method from an engineering and constructor's viewpoint, it will before long be demonstrated to cost less than the noise we have accepted for so long as a necessary evil. In such an event, the structural trades will adopt welding as a matter of course. But even if welding should always cost more, there will be many places where the silent method will be demanded by a harassed community, despite the extra. It would not be the first time that the value of public convenience and well being has overshadowed minor financial considerations, and hastened the adoption of some revolutionary proposal.

Straining for Super-Precision

ISTRUMENTS for measuring with utmost precision both linear and angular dimensions have come on in bewildering array in the past two decades. Some of these permit measurements which can be regarded as accurate to the millionth part of an inch. They depend in the most refined types upon the optical splitting up of the length of a light wave. Such devices reflect the highest credit upon those who have developed them.

With such ardor has this work been prosecuted,

however, that it has quite outrun practical needs of plant operation. In cases brought out at a recent meeting in the Engineering Societies Building, New York, purchasers had specified equipment with a required precision far beyond what was reasonable. In each case the manufacturer had quoted upon the devices, but without exception a conference had resulted in deliveries representing much lower precision than was at first demanded, and at a fraction of the initial cost. How often the matter has gone ahead on the original lines was not brought out and we have no means of knowing. However, it was said at the meeting that in many plants 20 per cent of the entire shop cost of producing materials is unproductively expended on attaining undue precision.

If this estimate be correct, it would seem in order for buyers and sellers of high-precision equipment to get together to determine what tolerances are necessary, and then to have the equipment made on that basis rather than on the buyer's knowledge that instruments of *n*th degree precision can be had.

Cartels and Competition

IN Europe the cartel idea has been widely adopted as a means of stabilizing prices and paving the way for industrial profits. Because of the agitation here and there for amendment of our anti-trust laws to permit price regulation such as is practiced by the Continental syndicates, our market news from Europe this week is pertinent.

The high domestic prices maintained by the European tube cartel have caused consumers to place orders with mills in non-member countries. Signs of disaffection are appearing in the heavy rail syndicate, the most inclusive of international steel cartels. One member country insists on taking business in excess of its quota, and a number of mills in other member countries are cutting the cartel price. By curious coincidence the Welsh-American tin plate understanding is also under indirect attack. British exporters, restricted in the amount of the Welsh product that they can handle, are buying German tin plate for resale on the world market.

These reports from abroad, although not yet conclusive in their significance, are nevertheless testimony to the difficulties that beset organized efforts to fix prices and parcel out markets. They remind us that our own price pools of a generation ago usually were broken through violations by members. Artificial restraints on business often invite their own destruction, particularly if they fail to take into account the interests of consumers and possible changes in production methods and costs.

There is reason to pause and consider whether the solution of destructive price competition lies in so obvious a remedy as concerted action among competitors to fix prices and divide markets. It is possible that more indirect methods, such as are being employed in this country, may prove more effective in the long run. Industrial consolidations, in many instances, have benefited both producer and consumer, insuring profits for the former and cheaper goods for the latter. Trade associations, although not attempting to regulate prices, have been increasingly influential in the interests of better cost accounting and fair play in competition. It

is to be hoped that this kind of organized activity can further extend its usefulness in curtailing business practices that are unethical and demoralizing, at the same time preserving competition in its soundest form.

Copper and Gasoline

THE consumption of copper, both at home and abroad, has been very large this year, which is mainly for the reason that this is an electrical age. The demand has been so great that it has been steadily reducing the stock of refined shapes, and at the first of this month the total in the hands of refiners in North and South America was only about 50,000 tons. An irreducible minimum would probably be about 40,000 tons, for the refiners must keep about that quantity on hand to be able to meet promptly the specifications of their customers, as a refiner can no more deplete his stock entirely than a hardware merchant can sell his shelves bare unless retirement from business is contemplated.

In speaking of the position of copper in North and South America, we are expressing the world's position nearly enough; for the refiners of those Continents, whose whole product is sold via New York, account for about 85 per cent of the world's refining. The statistics that are now possessed are moreover pretty thoroughly revealing; for their prompt and accurate disclosure of the position, in all respects, from mines to refineries, has made it safe for manufacturers to order closely, as never before, in conformity with their requirements.

In other words, manufacturers have not felt constrained, in recent years, to carry such reserves in their yards as formerly when they were more in the economic dark; and consequently more of the industrial stock has been visible and less of it invisible than used to be. It may reasonably be conjectured, however, that manufacturers observing the steady contraction in stocks this year have been recently stocking up to some extent, as prudence would inspire; and it may also be conjectured that producers, examining the same statistics, are taking steps to increase their output, for which they have available capacity.

In the meanwhile the price for copper has been quite stable, with a slowly rising tendency. At the beginning of 1928 it was 14½c. delivered in Connecticut and now it is 15½c., domestic deliveries in other territories and foreign deliveries being quoted correspondingly. The intensity of the demand has been an adequate explanation of this trend. Any other explaining would be in respect to the very moderation in the market, which has evinced no runaway signs, although they might have been expected.

When the market neared 15c., there were some inquiries from labor as to what would be coming to it, there having been an old understanding that a crossing of that mark meant an advance in wages. The American producers responded with a general advance of 10 per cent as to wages, probably considering it wiser to do that gracefully than under duress. This increased their cost of production about 0.5c. per lb., for it may be roughly generalized that the direct cost (exclusive of capital charges, etc.) is in the neighborhood of 10c. and that the payroll comes to about half of that. Following this the price was raised to 15¼c., which buyers were quite willing to pay.

One of our daily contemporaries published an edi-

torial criticizing this advance and it has been reported that the Federal Trade Commission will investigate it. For some mysterious reason the copper producers seem to be always under governmental suspicion. In this instance the advance is alleged to have been made uniformly, whence it is inferred that it may have been collusory. This does not accredit the copper producers with either any sense or any respect for the law.

When in a strong sellers' market one merchant advances his price, and ascertains that he can get it, his competitors are quick to do likewise. Similarly and oppositely in a buyers' market, when one producer starts cutting prices. This is the same whether it be copper or gasoline.

The situation in these two commodities—copper and gasoline—during 1928 has been indeed very similar. In both of them there is an excess of producing capacity but it does not follow therefrom that there should be a complete use of capacity with the consequences of slaughtering prices and extinguishment of profit on the entire capital investment.

The production of gasoline has been well maintained, but, without there having been any such great curtailment of the stock as has occurred in copper, the price for gasoline in Mid-Continent territory has risen from about 5.5c. per gallon in the early part of this year to a midsummer price of 9.5c., which still prevails, largely owing to the mild autumn. As the weather becomes inclement and automobiling contracts, there will probably be some softening of the price for gasoline. In this as in other commodities demand is the more potent influence in making the price. Producers always want to sell as much of their commodities as profitably they can, but buyers generally do not have to pay any more than they are willing to give.

Conquest of the Air

ADDRESSING the steel treaters at Philadelphia on Oct. 11, E. P. Warner, Assistant Secretary of the Navy for aviation, reminded his hearers that 436 years ago Columbus approached these shores by a primitive method of transportation and that four years ago at about the same time a rigid airship, which is now the Los Angeles, flew from Germany to the United States. Again at almost the same period this year, another dirigible was about to cross the Atlantic. And a few days after the Philadelphia meeting the arrival of the Graf Zeppelin at Lakehurst marked another epochal event in commercial aviation.

In the historic crossing of 1492 the dependence of the navigators was almost entirely upon wood; metals played a very small role. In the years following, iron, and then steel, became essential, and today, in most forms of transportation on land and sea, steel and its alloys are mainly responsible for the high degree of speed and safety attained.

It is through research in another field, however, that the flights of the Los Angeles and the Graf Zeppelin became possible. To the discovery of the light aluminum and related alloys, properly heat-treated, must be credited the success of these giants of the air, whose framework is made of the light alloys. In this achievement, as in recent improvements in construction which have made the airplane so efficient and de-

pendable, the cooperation of the steel treater and the metallurgist has been an indispensable factor.

Freight Car Requirements

IN view of recent suggestions that the railroads are likely to be heavier buyers of freight cars in the next few months than they have been for two years or more, statistics showing the recent trend or pace should be of interest.

Class I railroads, representing about 90 per cent of the railroad mileage and 96 per cent of the total revenues, installed and retired freight train cars, including cabooses, as follows in calendar years:

	Installed	Retired
1917	117,210	62,253
1918	65,249	56,024
1919	76,019	43,274
1920	36,044	75,197
1921	63,406	69,245
1922	105,394	126,471
1923	232,060	213,789
1924	156,572	118,590
1925	139,083	128,573
1926	93,369	103,152
1927	72,410	95,753

Monthly reports for seven months of this year show, for freight cars only, 33,748 cars installed and 48,554 cars retired, while August 1 there were 13,531 cars on order.

Thus for two and a half years the trend has been to install fewer cars than are retired, and the retirements themselves have been trending downward. At the end of last year the freight carrying cars in service were as follows, for Class I roads:

All steel	799,820
Steel underframe	1,086,982
Wooden	437,299

Total 2,324,101

Some confusion of thought resulted recently from publication of a report submitted by the arbitration committee of the mechanical division of the American Railway Association, it being assumed in some quarters that wooden cars were to be legislated out of service and that heavy buying of cars would thereby be forced. It has since been explained that it is the regular policy not to legislate equipment out, but to give it a chance to wear out. The recommendation was that no wooden cars under a certain definition be accepted from owners after January 1, 1931, and no wooden cars of another description be accepted for interchange after January 1, 1934.

In view of the policy it may properly be taken that wooden cars are to be retired in future as in the recent past, according to their wearing out. No large increase in the rate of retirement is to be expected, but on the other hand an increase in installations, relative to retirements, may be expected if traffic warrants.

In this connection there are significant data. Car surpluses have been progressively decreasing. Earlier this year car loadings were running below both 1927 and 1926, but in the past few weeks they have been running ahead of those years week by week. A large surplus of cars is naturally undesirable, but it certainly would seem well for the railroads to aim at having some surplus all the time. The cost of carrying the surplus would be much less than the cost, in derangements, of even temporary shortages.

CORRESPONDENCE

Against Legislation to Legalize Resale Price Fixing

To the Editor: I note in THE IRON AGE of Oct. 18 a discussion by your Washington correspondent of the provisions of the Kelly-Capper bill which is to come before the next Congress. The article says that the proponents of the bill expect that the Federal Trade Commission, which is now investigating the question, will be favorable to legislation permitting manufacturers of certain trademarked or branded articles that are distributed through jobbers and retailers to fix and maintain the resale price. It looks to me as if there were some special axes to be ground in this movement.

If the producer deems it desirable to prescribe the maintenance of a resale price, let him do so if he can. He becomes then, in effect, the retailer of his own goods, the final merchandiser acting as his agent. The producer has frequently incurred the expense of national advertising for the purpose of promoting sales at his price. If the manufacturer sees fit to limit the handling of his goods to those who will obey him, that is his right. A shopkeeper who is unwilling so to agree, who is unwilling to act in the quasi-capacity of agent, has no good ground for complaint if the manufacturer refuses to let him have the proprietary goods.

If on the other hand a shopkeeper sees fit to sacrifice a portion of his margin, he has a perfect right to do so, providing he has not entered into an agreement with the producer to the contrary. There are instances of the shopkeepers of a city entering into an agreement among themselves that they will not cut prices—as to which the supplier of the goods is indifferent. But let us not have any legislation on this subject.

A trademark is essentially an identification and confers no economic privileges unless it be monopolistic. The Eastman Kodak Co. may be able to maintain a uniform price for kodak films, but the manufacturer of Camel cigarettes would commit suicide if he attempted to do so.

So far as the writer can see there is no fault in our present system of merchandising and pricing. Consumers generally welcome the opportunity to buy cigarettes, razor blades and many other things at cut prices, and bless the mail order houses, chain stores and department stores that help them to do so. This is promotive of sales, wherefore there is no reasonable ground for complaint from the manufacturers.

Without any doubt our mail order houses, chain stores and department stores are economic benefits of the first order. Likewise there is no doubt that our older system of retail merchandising is overequipped and overmanned; that is, there are too many shops and too many persons attending them. The relatively high prices that are asked in them do not inure to the profit of the shopkeepers, comparatively few of whom become well to do, but they go to pay the wages of inefficiency, including unnecessary personnel. The chain stores are now estimated to be doing about 16 per cent of the retail business of this country. That percentage is swelled by what the department stores and mail order houses perform. There is thus proceeding naturally a correction of one of our greatest economic wastes.

There are consumers who are too lazy or too incompetent to take advantage of opportunities for advantageous buying, which might put them to more trouble. Such consumers simply pay the price for certain service, which is optional with them, wherefore they deserve no special consideration. We may feel sorry for the small shopkeepers and their clerks who are being thrust out of occupation; but similarly do we feel sorry for the surplus coal miners, for the surplus weavers and spinners, and others who are being forced into new and strange employments. The economic pressure is precisely analogous. Although we have sympathy for such persons in what is always a painful readjustment, that does not mean that either they or anyone else have claims for support by the body public.

The subject of resale prices is distinctly one to be let alone to go its own way. Anything of the nature of legislative price-fixing is abhorrent. Anything that the Federal Trade Commission or Congress might do would be meddling and pretty sure to be mischievous.

LAISSEZ FAIRE.

Increase in Fluorspar Duty Has Saved the Domestic Situation

To the Editor: The action of President Coolidge in raising the duty on fluorspar meets with the approval of all the producers of that mineral in the United States. As a matter of fact the imports of fluorspar have been, so far as the miners are concerned, a scandal. The foreigners in sending spar to this country, in my opinion, abused their privilege. They made the deliberate attempt to destroy the American industry and they came perilously near succeeding. What with cheap labor abroad and ballast rates across the ocean for freights the American spar miners have had no show whatever. The whole market was controlled and in the power of the foreigners.

In producing spar we pay the American rates of wages, we pay high prices for all our mining supplies and explosives, and to reach our markets we are paying the highest rates of freight that have ever been known—in many cases more than twice as much as we paid 15 years ago. We are not complaining of these things; they are part and parcel of our American industrial system; they belong to the large American plan of general prosperity. But because of our low duty the foreigners flooded the country with spar and the American miners have been denied their share of business, let alone their share of profits. We have been faced with an unfair and unjust competition and conditions can only be remedied by an adequate tariff. This increase that the President has just declared will tend to give us a share of the American market and it is highly probable that the spar mines that have been shut down so long, with all their investments idle, will be able to resume operations.

Furthermore, it is my belief that our American spar is of a substantially better quality than foreign spar. Practically all the spar produced in America comes from southern Illinois and western Kentucky. It is nearly all one region, cut across, however, and divided by the Ohio River. Gloom and despondency has been the chief factor in that region for the past five years. Idle mines, idle miners, have been the rule. Those interested in the spar industry are hoping to speedily see a change in the situation.

JAMES A. GREEN.

Cincinnati, Oct. 19.

Schedule of the next instalments of the Business Analysis and Forecast, by Dr. Lewis H. Haney, Director New York University Bureau of Business Research, follows: Nov. 1—Activity in Steel Consuming Industries; Nov. 15—Position of Iron and Steel Producers.

Iron and Steel Markets

Primary Materials Still Advancing

Prices of Scrap, Pig Iron and Coke Make Further Gains—

Pipe Line Order Calls for 45,000

Tons of Steel

THE fundamental strength of the iron and steel market is emphasized by continued advances in primary materials. Prices of pig iron, scrap and coke have made fresh gains, giving added support to an already strong situation in finished steel.

The pressure of steel producers to increase output has magnified the scarcity of scrap, and a consequent driving of blast furnaces to obtain a compensating increase in pig iron tonnage has created extra demands for furnace coke. Heavy melting scrap at Pittsburgh has advanced another 25c. to \$18 a ton, an increase of \$4 a ton since the third week in July and the highest price since September, 1926. Furnace coke at Connellsville, after rising 10c. a ton last week, has gone up another 15c. to \$2.90.

The pig iron market is also feeling the effects of the enlarged needs of steel companies. Their refusal to sell their surplus supplies has created a shortage of basic iron in the Valleys in the face of several sizable inquiries. This factor for price strength in what is primarily a steel producing district is matched by expanding demands for foundry grades in other territories.

At Chicago, Cleveland, Detroit and Ironton, foundry iron has advanced 50c. a ton. Sales of 38,000 tons at Cleveland were made up in large part of supplementary purchases for the current quarter. Reports from other centers also indicate that buyers had underestimated their requirements. Contracting for the first quarter has not yet assumed large proportions except in the Chicago district, where orders have been placed for fully 40 per cent of melters' requirements for that period.

In finished steel there are evidences, although not yet conclusive, that the peak of activity has been passed. At Pittsburgh shipments exceed incoming business in most products, notably bars, plates and shapes. At Cleveland a decline in bookings is also reported, but in the East the tonnage taken so far this month in the heavier rolled products has kept pace with that entered in the corresponding weeks in September.

Bar prices are especially strong in Eastern markets, where many buyers face the necessity of paying 2c., Pittsburgh, contrasted with 1.90c. to 1.95c., paid by contract customers for the quarter. At Chicago, specifications again exceed shipments, after a noticeable drop a week ago, and new business is slightly above the average of the past 12 weeks. Chicago prices for plates, shapes and bars are stronger, with 2c. rapidly giving way to 2.10c., an advance of \$2 a ton.

Steel production still holds at close to 90 per cent of capacity. Slightly reduced output is reported by Valley mills.

Current recession in the demand from the automotive industry is regarded as temporary, pending the starting of production on new models about the middle of next month. The Chevrolet company, the largest manufacturer bringing out a new car, has released its first orders for body steel and will shortly buy fender stock. Makers of automobile frames will resume operations at close to capacity in the third week of November.

The September report of independent makers of sheets and strips sustains the view that buyers ordered and specified freely to escape the reduction in cash discount effective Oct. 1. Sales were equivalent to 117.5 per cent of capacity and shipments 102.3 per cent.

Railroad equipment inquiries are increasing when car scarcity is being reported for the first time in several years. Whether this coincidence is significant or not, in view of the fact that instances of car stringency are isolated and by no means alarming, the week brought the Rock Island into the market for 2750 cars and the Canadian National for an additional 1500. Early inquiries are expected from the Missouri Pacific for 3000 cars and from the Buffalo, Rochester & Pittsburgh for 1000. The Pennsylvania has placed an order for 1000 box cars with its own shops.

The Roxana Petroleum Co. has divided 45,000 tons of 10-in. pipe for an oil line from McCamey to Houston, Tex., between a Youngstown and a Pittsburgh mill. The Southern Natural Gas Co. is inquiring for 25,000 tons of 4 to 24-in. pipe.

Two base prices on hot-rolled strip, rather than a single base, are being rather generally adopted, following issuance by the Sharon Steel Hoop Co. of a card of extras embracing all widths from 3/8 in. to 24 in.

Leading producers of ferromanganese have opened their books for all of next year at \$105, seaboard, the price now ruling. Heretofore contracts have been on a six months' basis.

A 50 per cent increase in the duty on gravel fluorspar (from \$5 to \$7.50 per net ton) will go into effect Nov. 19. An advance of \$1 a ton to \$18, mines, on domestic fluorspar for first quarter delivery is reported as a possibility.

Copper has again advanced 1/4c. a lb. to 15 1/2c., delivered in the Connecticut Valley. This is the highest price since May 16, 1923.

For the first time in many months THE IRON AGE pig iron composite price is higher than it was a year earlier. It is now \$17.92 a ton, compared with \$17.84 last week and a year ago. The finished steel composite remains at 2.362c. a lb.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics
At Date, One Week, One Month, and One Year Previous

Pig Iron, Per Gross Ton:	Oct. 23, 1928	Oct. 16, 1928	Sept. 25, 1928	Oct. 25, 1927
No. 2 foundry, Philadelphia.....	\$20.76	\$20.76	\$20.76	\$19.76
No. 2, Valley furnace.....	17.00	17.00	17.00	17.50
No. 2, Southern, Cin'tl.....	19.94	19.94	19.94	20.94
No. 2, Birmingham.....	16.25	16.25	16.25	17.25
No. 2 foundry, Chicago*.....	19.00	18.50	18.50	18.50
Basic, del'd eastern Pa.....	19.75	19.75	19.00	20.00
Basic, Valley furnace.....	17.00	17.00	16.25	17.00
Valley Bessemer, del'd P'gh.....	19.26	19.26	19.01	19.76
Malleable, Chicago*.....	19.00	18.50	18.50	18.50
Malleable, Valley.....	17.50	17.50	17.25	17.50
Gray forge, Pittsburgh.....	18.26	18.26	18.26	18.76
L. S. charcoal, Chicago.....	27.04	27.04	27.04	27.04
Ferromanganese, furnace.....	105.00	105.00	105.00	90.00

Rails, Billets, Etc., Per Gross Ton:

	Oct. 23, 1928	Oct. 16, 1928	Sept. 25, 1928	Oct. 25, 1927
O.-h. rails, heavy, at mill.....	\$43.00	\$43.00	\$43.00	\$43.00
Light rails at mill.....	36.00	36.00	36.00	36.00
Bess. billets, Pittsburgh.....	33.00	33.00	32.00	33.00
O.-h. billets, Pittsburgh.....	33.00	33.00	32.00	33.00
O.-h. sheet bars, P'gh.....	33.00	33.00	32.00	34.00
Forging billets, P'gh.....	38.00	38.00	38.00	38.00
O.-h. billets, Phila.....	37.30	37.30	37.30	38.30
Wire rods, Pittsburgh.....	42.00	42.00	42.00	42.00
	Cents	Cents	Cents	Cents
Skelp, grvd. steel, P'gh, lb.....	1.90	1.90	1.90	1.75

Finished Iron and Steel,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Iron bars, Philadelphia.....	2.12	2.12	2.12	2.07
Iron bars, Chicago.....	2.00	2.00	2.00	1.85
Steel bars, Pittsburgh.....	1.90	1.90	1.90	1.75
Steel bars, Chicago.....	2.00	2.00	2.00	1.85
Steel bars, New York.....	2.24	2.24	2.24	2.09
Tank plates, Pittsburgh.....	1.90	1.90	1.90	1.75
Tank plates, Chicago.....	2.00	2.00	2.00	1.85
Tank plates, New York.....	2.22½	2.22½	2.17½	2.09
Beams, Pittsburgh.....	1.90	1.90	1.90	1.75
Beams, Chicago.....	2.00	2.00	2.00	1.85
Beams, New York.....	2.19½	2.19½	2.14½	2.09
Steel hoops, Pittsburgh.....	2.20	2.20	2.20	2.30

*The average switching charge for delivery to foundries in the Chicago district is 61c. per ton.

On export business there are frequent variations from the above prices. Also, in domestic business, there is at times a range of prices on various products, as shown in our market reports on other pages.

Sheets, Nails and Wire, Per Lb. to Large Buyers:	Oct. 23, 1928	Oct. 16, 1928	Sept. 25, 1928	Oct. 25, 1927
	Cents	Cents	Cents	Cents
Sheets, black, No. 24, P'gh.....	2.75	2.75	2.65	2.80
Sheets, black, No. 24, Chicago dist. mill.....	2.85	2.85	2.75	3.00
Sheets, galv., No. 24, P'gh.....	3.50	3.50	3.40	3.70
Sheets, galv., No. 24, Chicago dist. mill.....	3.60	3.60	3.60	3.85
Sheets, blue, 9 & 10, P'gh.....	2.00	2.00	2.00	2.10
Sheets, blue, 9 & 10, Chicago dist. mill.....	2.10	2.10	2.10	2.30
Wire nails, Pittsburgh.....	2.55	2.55	2.55	2.50
Wire nails, Chicago dist. mill.....	2.60	2.60	2.60	2.60
Plain wire, Pittsburgh.....	2.40	2.40	2.40	2.40
Plain wire, Chicago dist. mill.....	2.45	2.45	2.45	2.45
Barbed wire, galv., Pittsburgh.....	3.20	3.20	3.20	3.20
Barbed wire, galv., Chicago dist. mill.....	3.25	3.25	3.25	3.30
Tin plate, 100 lb. box, P'gh.....	\$5.25	\$5.25	\$5.25	\$5.50

Old Material, Per Gross Ton:

Heavy melting steel, P'gh.....	\$18.00	\$17.75	\$16.75	\$14.50
Heavy melting steel, Phila.....	16.00	16.00	15.50	14.00
Heavy melting steel, Ch'go.....	14.00	14.00	13.00	11.50
Carwheels, Chicago.....	13.75	13.75	13.50	13.50
Carwheels, Philadelphia.....	16.50	16.50	16.50	15.50
No. 1 cast, Pittsburgh.....	15.50	15.50	15.00	14.75
No. 1 cast, Philadelphia.....	17.00	17.00	17.00	16.50
No. 1 cast, Ch'go (net ton).....	15.50	15.50	15.00	14.00
No. 1 RR. wrot., Phila.....	15.50	15.50	15.50	15.50
No. 1 RR. wrot., Ch'go (net).....	12.75	12.75	12.00	10.00

Coke, Connellsville, Per Net Ton at Oven:

Furnace coke, prompt.....	\$2.90	\$2.85	\$2.75	\$2.85
Foundry coke, prompt.....	3.75	3.75	3.75	4.00

Metals,

Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Lake copper, New York.....	15.02½	15.25	15.25	13.25
Electrolytic copper, refinery.....	15.25	15.00	15.00	13.00
Zinc, St. Louis.....	6.25	6.25	6.25	5.95
Zinc, New York.....	6.60	6.60	6.60	6.30
Lead, St. Louis.....	6.32½	6.32½	6.32½	5.95
Lead, New York.....	6.50	6.50	6.50	6.25
Tin (Straits), New York.....	48.75	48.50	48.62½	53.50
Antimony (Asiatic), N. Y.....	10.50	11.00	11.00	11.00

Pittsburgh

Primary Materials Strengthen as Heavy Steel Operations Draw on Scanty Supplies

PITTSBURGH, Oct. 23.—The primary materials rather than steel have held the center of the stage in the past week. With a further advance of 25c. a ton on heavy melting steel scrap in this market, the scramble of dealers to obtain material for delivery on old orders has not subsided, and to make the situation even stronger there have been some rather large purchases in the Youngstown district at \$18 to \$18.50, which effectually shut off the possibility of local dealers getting material in the West. Advances of 50c. to \$1 a ton are being sought on pig iron, especially on the basic grade, which seems to be badly wanted for prompt shipment by at least four melters. Coke is keeping up with the procession. No spot furnace fuel for prompt delivery is available under \$2.90 per net ton at Connellsville ovens and sales of small lots at as high as \$3.

The movement in these materials is a direct reflection of the exceptional activity in the steel market over the past 45 days. The steel companies have been persistent in demanding delivery of scrap on their orders, and, in the absence of large supplies, prices have soared steadily. Pig iron has gained in value with the rise in scrap and coke has stiffened because of the demands occasioned by the necessity of driving blast furnaces to the limit to get all the pig

iron that is needed with scrap scarce and finished steel orders large.

The steel market, however, lately has given signs that the peak of the activity was being passed. Again in the past week shipments have outrun incoming business in most products, notably in bars, plates and shapes. Some of the sheet makers report having added slightly to backlogs in the past week and some of the producers of strips have a similar report. If an order for 40,000 tons of pipe for

a Texas oil line has not already been placed, it is likely to be in the next few days. Generally, however, order books are beginning to grow smaller, and a fresh wave of buying will be necessary to sustain plant operations at the present rate. In the Youngstown district, a slight recession has taken place, despite the fact that sheets appear to be the most active of all steel products and Youngstown is the center of production. Ingot production for the Pittsburgh-Wheeling-Youngstown-Johnstown district, however, remains at about 90 per cent of capacity.

The matter of the new base prices and the card of extras for hot-rolled strips has been clarified by the appearance of a card embracing all widths from ¾ in. to 24 in., with a base price of 1.90c. for material 6 in. and wider and of 2c., base, for stock under 6 in. Several manufacturers have announced adoption of this card, which will probably now find general use.

Steel prices generally are firm, a condition usual to periods like the present, with producers well supplied with orders and buyers covered against their immediate needs.

Pig Iron.—Generally higher prices are being sought for pig iron, but as yet have been unrealized, as the price ideas of buyers are not moving upward as rapidly as those of producers. Most producers now are quoting basic iron at \$18 and are holding malleable and Bessemer at the same price, while the common asking price on foundry iron is \$17.50 for No. 2, all prices being f.o.b. Valley furnace. At least four melters of basic iron are reported as interested in supplies, and, as the steel companies still are refusing to sell any of their surplus, merchant furnaces are seizing the opportunity to put the market back on a profitable basis. One sale of slightly less than 2000 tons of basic iron, somewhat off in analysis, is reported at a price that figures out to \$17.50, Valley furnace, for strictly standard analysis iron, but aside from this sale there has been no business to justify a higher price than \$17. A fair appraisal of the market on this grade is \$17 to \$18, the lower price representing the last sale of importance of standard iron and the higher figure being what now is wanted by producers. Small sales of both Bessemer and malleable iron are reported at \$18, Valley furnace, but in the past week quite as much tonnage has been sold at \$17.50. There also have been sales at \$17. Aside from basic iron, there is very little consumer interest and in that grade the call is for iron for prompt delivery, which makes the higher asking prices somewhat of a premium for early shipment. The Carnegie Steel Co. has put on a blast furnace of its Edgar Thomson group. This reflects a big demand for sheet bars and the approach of the rail rolling period. The Bethlehem Steel Co. has taken off a furnace at Johnstown, Pa.

Prices per gross ton, f.o.b. Valley furnace:
 Basic \$17.00 to \$18.00
 Bessemer 17.50 to 18.00
 Gray forge 16.50 to 17.00
 No. 2 foundry 17.00 to 17.50
 No. 3 foundry 16.50 to 17.00
 Malleable 17.50 to 18.00
 Low phos., copper free.... 26.50 to 27.00

Freight rate to Pittsburgh or Cleveland district, \$1.76.

Ferroalloys.—Leading producers have announced a price of \$105, Atlantic seaboard, on ferromanganese.

this price to be good for all of next year. Willingness to take business for the entire year represents a departure, as hitherto contracts have been on a six months' basis. The price announcement is much earlier than usual, owing, it is said, to a desire by producers to stop suggestions recently current that an advance was likely.

Hot-Rolled Flats.—The Sharon Steel Hoop Co. has issued a new card of extras covering widths from ½ in. to 24 in. This range of widths takes in the hoop and band sizes and means that these products and strips now are on a common card and a common base, which for widths less than 6 in. is 2c., Pittsburgh, and for 6 in. and wider, 1.90c., Pittsburgh. The Republic Iron & Steel Co. and several other producers have announced adoption of this card and of a double base price, splitting at 6 in. Eventually, a single base for all widths is probable, as in formulating the new card the Sharon Steel Hoop Co. announces that the effort has been to correct inequalities that existed in the old card, and a single base, plus the new extras, corrects those errors. Strip mill capacity in this district still is heavily engaged, with orders and specifications almost equaling shipments. Not much business yet has been done on the new base prices or extras, because so many users are under contract for this quarter on the old base and card.

Cold-Rolled Strips.—Makers are very firm at 2.85c., base Pittsburgh, on new business and some business is being taken on that level, although the bulk of the shipments carry a price \$2 a ton less.

Semi-Finished Steel.—A large movement of billets, slabs and sheet bars on contracts continues. Most non-integrated strip and sheet producers were able to secure this month's requirements on third quarter contracts carrying prices \$1 a ton below fourth quarter prices, but are using up supplies so rapidly that it is doubtful whether they can go far into November without ordering against contracts for this period. Strip and sheet mills have rarely been more

heavily engaged. Wire rods are moving steadily, and the price is well maintained at \$42, base Pittsburgh or Cleveland.

Bars, Plates and Shapes.—Shipments of these products are exceeding incoming business, and, with order books decreasing, delivery promises on new business in bars have shortened slightly. At the beginning of the month many mills were mentioning four weeks as the earliest delivery on popular sizes, but now they can be had in two to three weeks. Delivery promises have not been extended on shapes or plates, and the latter are available for fairly prompt shipment. Prices are very firm at a range of 1.90c. to 2c., base Pittsburgh, with the lower figure available chiefly to important buyers, while the higher figure refers to small and unattractive tonnages and is being paid more frequently for bars than for shapes and plates. Structural shops here uniformly report quiet business in the past week. Much business is in prospect.

Rails and Track Supplies.—The larger roads depending upon Pittsburgh mills for a good part of their rails and track supplies have not yet distributed orders for their 1929 requirements. But the expectation of the early closing of this business creates a better feeling in this division of the market. Light-section rails and small spikes are very slow.

Tubular Goods.—The market is running in its recent grooves, with a good demand for seamless oil country pipe, a steady demand for butt welded pipe for building construction and heating purposes, but only a moderate degree of activity in lap welded pipe aside from that required for pipe lines. Most makers have backlogs in the latter class, and a local and a Youngstown maker will divide an order for 450 miles of 10-in. pipe for an oil line from McCamey to Houston, Tex., while there is an inquiry out for 25,000 tons of 4 to 24-in. pipe from the Southern Natural Gas Co.

Wire Products.—Nails are rather slow with most makers, but wire products business as a whole is making a

THE IRON AGE Composite Prices

Finished Steel

Oct. 23, 1928, 2.362c. a Lb.

One week ago.....	2.362c.
One month ago.....	2.348c.
One year ago.....	2.293c.
10-year pre-war average.....	1.689c.

Based on steel bars, beams, tank plates, wire, rails, black pipe and black sheets. These products constitute 87 per cent of the United States output of finished steel.

	High		Low	
1928	2.364c.	Feb. 14:	2.314c.	Jan. 3
1927	2.453c.	Jan. 4:	2.293c.	Oct. 25
1926	2.453c.	Jan. 5:	2.403c.	May 18
1925	2.560c.	Jan. 6:	2.396c.	Aug. 18
1924	2.789c.	Jan. 15:	2.460c.	Oct. 14
1923	2.824c.	Apr. 24:	2.446c.	Jan. 2

Pig Iron

Oct. 23, 1928, \$17.92 a Gross Ton

One week ago.....	\$17.84
One month ago.....	17.71
One year ago.....	17.84
10-year pre-war average.....	15.72

Based on average of basic iron at Valley furnace and foundry irons at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

	High		Low	
1928	\$17.92,	Oct. 23:	\$17.04,	July 24
1927	19.71,	Jan. 4:	17.54,	Nov. 1
1926	21.54,	Jan. 5:	19.46,	July 13
1925	22.50,	Jan. 13:	18.96,	July 7
1924	22.88,	Feb. 26:	19.21,	Nov. 3
1923	30.86,	Mar. 20:	20.77,	Nov. 20

Mill Prices of Finished Iron and Steel Products

Iron and Steel Bars

Soft Steel

	Base per Lb.
F.o.b. Pittsburgh mill.....	1.90c. to 2.00c.
F.o.b. Chicago.....	2.00c. to 2.10c.
Del'd Philadelphia.....	2.22c. to 2.32c.
Del'd New York.....	2.24c. to 2.34c.
Del'd Cleveland.....	1.92½c. to 2.05c.
F.o.b. Cleveland.....	1.90c. to 2.05c.
F.o.b. Lackawanna.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
C.i.f. Pacific ports.....	2.35c.
F.o.b. San Francisco mills.....	2.35c. to 2.40c.

Billet Steel Reinforcing

F.o.b. Pittsburgh mills, 40, 50 and 60-ft. lengths.....	2.00c.
F.o.b. Pittsburgh mills, cut lengths.....	2.25c.
F.o.b. Birmingham.....	2.15c.

Rail Steel

F.o.b. mills east of Chicago dist.....	1.85c.
F.o.b. Chicago Heights mill.....	1.95c.

Iron

Common iron, f.o.b. Chicago.....	2.00c. to 2.10c.
Refined iron, f.o.b. P'gh mills.....	2.75c.
Common iron, del'd Philadelphia.....	2.12c.
Common iron, del'd New York.....	2.14c.

Tank Plates

	Base per Lb.
F.o.b. Pittsburgh mills.....	1.90c. to 2.00c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
Del'd Cleveland.....	2.09c. to 2.19c.
Del'd Philadelphia.....	2.15c. to 2.25c.
F.o.b. Coatesville.....	2.05c. to 2.15c.
F.o.b. Sparrows Point.....	2.05c. to 2.15c.
F.o.b. Lackawanna.....	2.00c. to 2.10c.
Del'd New York.....	2.22½c. to 2.32½c.
C.i.f. Pacific ports.....	2.20c. to 2.30c.

Structural Shapes

	Base per Lb.
F.o.b. Pittsburgh mills.....	1.90c. to 2.00c.
F.o.b. Chicago.....	2.00c. to 2.10c.
F.o.b. Birmingham.....	2.15c.
F.o.b. Lackawanna.....	2.00c. to 2.10c.
F.o.b. Bethlehem.....	2.05c. to 2.15c.
Del'd Cleveland.....	2.09c. to 2.19c.
Del'd Philadelphia.....	2.11c. to 2.21c.
Del'd New York.....	2.19½c. to 2.29½c.
C.i.f. Pacific ports.....	2.35c.

Hot-Rolled Flats (Hoops, Bands and Strips)

	Base per Lb.
Narrower than 6 in., P'gh.....	2.00c.
6 in. and wider, P'gh.....	1.90c.
Narrower than 6 in., Chicago.....	2.10c.
6 in. and wider, Chicago.....	2.00c.
Cotton ties, f.o.b. Atlantic and Gulf ports:	
Carload per 45-lb. bundle.....	\$1.27
2000 bundle lots.....	1.25
Larger lots.....	1.23

*Mills follow plate or sheet prices according to gage on wider than 12 in.

Cold-Finished Steel

	Base per Lb.
Bars, f.o.b. Pittsburgh mill.....	2.20c.
Bars, f.o.b. Chicago.....	2.20c.
Bars, Cleveland.....	2.25c.
Shafting, ground, f.o.b. mill.....	2.55c. to 3.50c.
Strips, P'gh.....	2.75c. to 2.95c.
Strips, Cleveland.....	2.75c. to 2.95c.
Strips, del'd Chicago.....	3.05c. to 3.25c.
Strips, Worcester.....	3.00c. to 3.10c.
Fender stock, Pittsburgh.....	4.25c.

*According to size.

Wire Products

(To jobbers in car lots, f.o.b. Pittsburgh and Cleveland)

	Base Per Keg
Wire nails.....	\$2.55
Galvanized nails.....	4.55
Galvanized staples.....	3.25
Polished staples.....	3.00
Cement coated nails.....	2.55

Base Per 100 Lb.

Bright plain wire, No. 9 gage.....	\$2.40
Annealed fence wire.....	2.55
Spring wire.....	3.40
Gal'd wire, No. 9.....	3.00
Barbed wire, gal'd.....	3.20
Barbed wire, painted.....	2.95

Chicago district mill and delivered Chicago prices are \$1 per ton above the foregoing. Birmingham mill prices \$3 a ton higher; Worcester Mass., (wire) mill \$3 a ton higher on production of that plant; Duluth, Minn., mill \$2 a ton higher; Anderson, Ind., \$1 higher.

Woven Wire Fence

Base to Retailers Per Net Ton

F.o.b. Pittsburgh.....	\$65.00
F.o.b. Cleveland.....	65.00
F.o.b. Anderson, Ind.....	66.00
F.o.b. Chicago district mills.....	67.00
F.o.b. Duluth.....	68.00
F.o.b. Birmingham.....	68.00

Sheets

Blue Annealed

Base per Lb.

Nos. 9 and 10, f.o.b. P'gh.....	2.00c.
Nos. 9 and 10, f.o.b. Chicago dist.....	2.10c.
Nos. 9 and 10, del'd Cleveland.....	2.19c.
Nos. 9 and 10, del'd Philadelphia.....	2.32c. to 2.42c.
Nos. 9 and 10, f.o.b. Birmingham.....	2.15c.

Box Annealed, One Pass Cold Rolled

No. 24, f.o.b. Pittsburgh.....	2.75c.
No. 24, f.o.b. Chicago dist. mill.....	2.85c.
No. 24, del'd Cleveland.....	2.94c.
No. 24, del'd Philadelphia.....	3.07c. to 3.17c.
No. 24, f.o.b. Birmingham.....	2.90c.

Metal Furniture Sheets

No. 24, f.o.b. Pittsburgh, A grade.....	3.85c. to 3.90c.
No. 24, f.o.b. Pittsburgh, B grade.....	3.65c. to 3.70c.

Galvanized

No. 24, f.o.b. Pittsburgh.....	3.50c. to 3.60c.
No. 24, f.o.b. Chicago dist. mill.....	3.60c.
No. 24, del'd Cleveland.....	3.68c.
No. 24, del'd Philadelphia.....	3.82c. to 3.92c.
No. 24, f.o.b. Birmingham.....	3.65c. to 3.70c.

Tin Mill Black Plate

No. 28, f.o.b. Pittsburgh.....	2.90c.
No. 28, f.o.b. Chicago dist. mill.....	3.00c.

Automobile Body Sheets

No. 20, f.o.b. Pittsburgh.....	4.00c.
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Long Ternes

No. 24, 8-lb. coating, f.o.b. mill primes.....	4.10c.
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Tin Plate

Per Base Box

Standard cokes, f.o.b. P'gh district mills.....	\$5.25
Standard cokes, f.o.b. Gary.....	5.35

Terne Plate

(F.o.b. Morgantown or Pittsburgh)

(Per Package, 20 x 28 in.)

8-lb. coating I.C. \$11.20	25-lb. coating I.C. \$16.70
15-lb. coating I.C. 14.00	30-lb. coating I.C. 17.75
20-lb. coating I.C. 15.30	40-lb. coating I.C. 19.85

Alloy Steel Bars

(F.o.b. maker's mill)

Alloy Quality Bar Base, 2.75c.

S.A.E. Series Numbers	Alloy Differential	Net Price 100 Lb. Bars
2000 (¼% Nickel).....	\$0.25	\$3.00
2100 (1¼% Nickel).....	0.55	3.30
2300 (3¼% Nickel).....	1.50	4.25
2500 (5% Nickel).....	2.25	5.00
3100 Nickel Chromium.....	0.55	3.30
3200 Nickel Chromium.....	1.55	4.10
3300 Nickel Chromium.....	3.80	6.55
3400 Nickel Chromium.....	3.20	5.95
4100 Chromium Molybdenum (0.15 to 0.25 Molybdenum).....	0.50	3.25
4100 Chromium Molybdenum (0.25 to 0.40 Molybdenum).....	0.70	3.45
4600 Nickel Molybdenum (0.20 to 0.30 Molybdenum, 1.25 to 1.75 Nickel).....	1.05	3.80
5100 Chromium Steel (0.60 to 0.90 Chromium).....	0.35	3.10
5100 Chromium Steel (0.80 to 1.10 Chromium).....	0.45	3.20
5100 Chromium Spring Steel	0.20	2.95
6100 Chromium Vanadium Bars.....	1.20	3.95
6100 Chromium Vanadium Spring Steel.....	0.95	3.70
9250 Silicon Manganese Spring Steel (flats).....	0.25	3.00
Rounds and squares.....	0.50	3.25
Chromium Nickel Vanadium.....	1.50	4.25
Carbon Vanadium.....	0.95	3.70

Above prices are for hot-rolled steel bars, forging quality. The ordinary differential for cold-drawn bars is 1c. per lb. higher. For billets 4 x 4 to 10 x 10 in., the price for a gross ton is the net price for bars of the same analysis. For billets under 4 x 4 down to and including 2½ in. squares, the price is \$5 a gross ton above the 4 x 4 billet price.

Slabs with sectional area of 16 in. or over carry the billet price; slabs with sectional area of 12 in. to 16 in. carry a \$5 extra above the billet price and slabs with a sectional area under 12 in. carry the bar price.

Band sizes are 40c. per 100 lb. higher.

Rails

Per Gross Ton

Standard, f.o.b. mill.....	\$43.00
Light (from billets), f.o.b. mill.....	36.00
Light (from rail steel), f.o.b. mill.....	34.00
Light (from billets), f.o.b. Ch'go mill.....	36.00

Track Equipment

Base Per 100 Lb.

Spikes, ½ in. and larger.....	\$2.80
Spikes, ½ in. and smaller.....	2.80
Spikes, boat and barge.....	3.00
Tie plates, steel.....	2.15
Angle bars.....	2.75
Track bolts, to steam railroads.....	\$3.80 to 4.00
Track bolts, to jobbers, all sizes, per 100 count.....	70 per cent off list

Welded Pipe

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

Butt Weld

Inches	Steel Black	Galv.	Inches	Iron Black	Galv.
¾.....	45	19½	¾ to 1.....	+11	+39
1.....	51	25½	1 to 1½.....	22	2
1½.....	56	42½	1½ to 2.....	28	11
2.....	60	48½	2 to 2½.....	30	13
2½.....	62	50½			

Lap Weld

2.....	55	43½	2.....	28	7
2½ to 6.....	59	47½	2½.....	26	11
7 and 8.....	56	43½	3 to 6.....	28	13
9 and 10.....	54	42½	7 to 12.....	26	11
11 and 12.....	53	40½			

Butt Weld, extra strong, plain ends

¾.....	41	24½	¾ to 1.....	+19	+54
1.....	47	30½	1 to 1½.....	21	17
1½.....	53	42½	1½ to 2.....	28	12
2.....	58	47½	2 to 2½.....	30	14
2½ to 3.....	60	49½			
3 to 4.....	61	50½			

Lap Weld, extra strong, plain ends

2.....	53	42½	2.....	28	9
2½ to 4.....	57	46½	2½ to 4.....	29	15
4½ to 6.....	56	45½	4½ to 6.....	28	14
7 to 8.....	52	39½	7 to 8.....	21	7
9 and 10.....	45	32½	9 to 12.....	16	2
11 and 12.....	44	31½			

On carloads the above discounts on steel pipe are increased on black by one point, with supplementary discount of 5%, and on galvanized by 1½ points, with supplementary discount of 5%. On iron pipe, both black and galvanized, the above discounts are increased to jobbers by one point with supplementary discounts of 5 and 2½%.

Note—Chicago district mills have a base two points less than the above discounts. Chicago delivered base is 2½ points less. Freight is figured from Pittsburgh, Lorain, Ohio, and Chicago district mills, the billing being from the point producing the lowest price to destination.

Boiler Tubes

Base Discounts, f.o.b. Pittsburgh

Lap Welded Steel	Charcoal Iron
2 to 2½ in..... 27	1½ in. +18
2½ to 3 in..... 37	1½ to 1¾ in. + 8
3 in. 40	2 to 2½ in. - 2
3½ to 3¾ in..... 42½	2½ to 3 in. - 7
4 to 4½ in..... 46	3½ to 4½ in. - 9
5 to 6 in..... 40	

Beyond the above base discounts, the following extra discounts are given:

Lap Weld Steel	Charcoal Iron
Under 5000 lb.....	4 Fives 1 Ten
5000 lb. to 12,000 lb....	5 Fives 2 Tens
12,000 lb. to 21,000 lb..	6 Fives 2 Tens & 2½
21,000 lb. and over.....	7 Fives 2 Tens & 5

Standard Commercial Seamless Boiler Tubes

Cold Drawn			
1 in.	63	3 in.	48
1½ to 1¾ in... ..	55	3½ to 3¾ in... ..	50
1¾ in.	39	4 in.	53
2 to 2¼ in.	34	4½, 5 and 6 in..	45
2¼ to 2½ in... ..	42		

Less carload, 4 points less. Add \$8 per net ton for more than four gages heavier than standard. No extra for lengths up to and including 24 ft. Sizes smaller than 1 in. and lighter than standard gage to be held at mechanical tubes list and discount. Intermediate sizes and gages not listed take price of next larger outside diameter and heavier gage.

Seamless Mechanical Tubing

Per Cent Off List

Carbon, 0.10% to 0.30%, base (carloads).....	55
Carbon, 0.30% to 0.40%, base.....	50
Plus differentials for lengths over 18 ft. and for commercial exact lengths: Warehouse discounts on small lots are less than the above.	

good showing in comparison with the average for this time of the year. Prices are well maintained on all products. Bright nails are being sold in carload lots at \$2.55, base, per keg to jobbers, but evidence is lacking that all makers are insisting upon an advance of 10c. per keg to others who are able to buy in carload lots.

Sheets.—The market still is extremely active, and some makers report that they have added slightly to their backlogs, bookings in the past week having exceeded their shipments. The monthly report of the National Association of Flat Rolled Steel Manufacturers on September sheet business fully sustained the current reports that buyers were ordering and specifying freely to escape the lower cash discount effective Oct. 1, and to avoid higher prices named on the common finishes for this quarter. Sales of the independent companies reporting were 117.5 per cent of capacity and shipments 102.2 per cent of capacity, making the month one of the best since records were made public. Mills are encountering reports of lower prices, but, generally, the quoted prices are ruling. No material letdown in the demand from motor car body builders is reported here, as loss of business incident to the slowing up of some companies is offset by increasing production by others. Mill operations remain at full physical capacity, with some producers running at full theoretical capacity.

Tin Plate.—Business still is rather slow, although some makers in the past week have enjoyed a slight increase in orders. General line tin plate is in good demand, and there is a fairly good export business. Packers' can requirements have been satisfied for this year and not much business for early 1929 needs is expected until prices have been announced.

Warehouse Prices, f.o.b. Pittsburgh

	Base per Lb.
Plates	3.00c.
Structural shapes	3.00c.
Soft steel bars and small shapes	2.90c.
Reinforcing steel bars	2.75c.
Cold-finished and screw stock—	
Rounds and hexagons	3.60c.
Squares and flats	4.10c.
Bands	3.60c.
Hoops	4.00c. to 4.50c.
Black sheets (No. 24), 25 or more bundles	3.70c.
Galv. sheets (No. 24), 25 or more bundles	4.55c.
Blue ann'l'd sheets (No. 10), 1 to 10 sheets	3.35c.
Galv. corrug. sheets (No. 28), per square	\$4.43
Spikes, large	3.40c.
Small	3.80c. to 5.25c.
Boat	3.80c.
Track bolts, all sizes, per 100 count, 60 per cent off list	
Machine bolts, 100 count, 60 per cent off list	
Carriage bolts, 100 count, 60 per cent off list	
Nuts, all styles, 100 count, 60 per cent off list	
Large rivets, base per 100 lb.	\$3.50
Wire, black soft ann'l'd, base per 100 lb.	\$3.00 to 3.10
Wire, galv. soft, base per 100 lb.	3.00 to 3.10
Common wire nails, per keg	3.00
Cement coated nails, per keg	3.05

Old Material.—Typical of such market conditions as the present, are reports that this mill or that has bought and paid an even higher price than has recently prevailed for heavy melting steel. Such reports are that the United States Steel Corporation bought a big tonnage, that the Jones & Laughlin Steel Corporation, which has been out of the open market for several years, was a purchaser, and that a large tonnage of heavy melting steel was bought by Youngstown steel companies. There is some acceptance of the report about the Youngstown purchases in the fact that steel works in that district are operating practically full and deliveries on low-priced scrap orders were not sufficient. But fresh buying in this district has been very light on the part of steel producers and the market has been chiefly made by dealer purchases to cover short sales. The market has strengthened, however, and, while no sales of heavy melting steel into consumption are noted at more than \$18, there appears to be none of this grade available at less. Compressed sheets are not available at less than \$17.50 and the market is firmer on heavy breakable cast which has sold at \$14.50. Steel foundry grades also are firmer.

Prices per gross ton delivered consumers' yards in Pittsburgh and points taking the Pittsburgh district freight rate:

Basic Open-Hearth Grades:	
Heavy melting steel	\$18.00
Scrap rails	17.50
Compressed sheet steel	17.50
Bundled sheets, sides and ends	\$15.50 to 16.00
Cast iron carwheels	15.25 to 15.75
Sheet bar crops, ordinary	18.00
Heavy breakable cast	14.00 to 14.50
No. 2 railroad wrought	18.00
Heavy steel axle turnings	15.00 to 15.50
Machine shop turnings	11.00 to 11.50
Acid Open-Hearth Grades:	
Railr. knuckles and couplers	19.00 to 19.50
Railr. coil and leaf springs	19.00 to 19.50
Rolled steel wheels	19.00 to 19.50
Low phos. billet and bloom ends	20.50 to 21.00
Low phos. mill plates	19.00 to 19.50
Low phos. light grade	18.00 to 18.50
Low phos. sheet bar crops	19.00 to 19.50
Hvy. steel axle turnings	15.00 to 15.50

Electric Furnace Grades:	
Low phos. punchings	18.50 to 19.00
Hvy. steel axle turnings	15.00 to 15.50

Blast Furnace Grades:	
Short shoveling steel turnings	12.50 to 12.75
Short mixed borings and turnings	12.50 to 12.75
Cast iron borings	12.50 to 12.75
No. 2 busheling	11.25 to 11.75

Rolling Mill Grades:	
Steel car axles	19.00 to 20.00
No. 1 railroad wrought	13.50 to 14.00
Sheet bar crops	18.00 to 18.50

Cupola Grades:	
No. 1 cast	15.50 to 16.00
Rails 3 ft. and under	18.00 to 18.50

Cold-Finished Steel Bars and Shafting.—Reports as to business vary somewhat, but such slowing down as there has been in automobile production has not been felt. There is still much insistence on deliveries. Prices are firm at 2.20c., base Pittsburgh or Chicago.

Bolts, Nuts and Rivets.—Business is good enough to sustain an operation of approximately 60 per cent of capacity. Makers consider this a satisfactory operation, since so many

large consumers are making their own supplies. Prices are firm.

Coke and Coal.—Spot furnace coke is scarce this week owing to some extra demands from a Buffalo steel company anxious to increase pig iron production and a local steel company unable, on account of low water, to transport by river as much coke as is needed from its own ovens. Coke for immediate delivery has readily commanded \$2.90 per net ton at ovens and even \$3 has been paid for small lots. More ovens are going in, however, and coke for delivery next week is plentiful. Spot foundry coke is doing well at unchanged prices. The coal market is good only in household sizes, with slack still a drug on the market.

Pig Iron in Detroit at \$19: Scrap Firm

DETROIT, Oct. 23.—Producers of pig iron serving the district are quoting \$19, and the market is very firm on this base. Despite reduction in melt in automotive shops, due to change in models, the stove and furnace manufacturers have increased melt sufficiently to take up the slack, with the result that shipments of pig iron are about the same as in September.

The market on old material in the district is very firm, with flashings registering an advance of 25c. per ton.

Dealers' buying prices per gross ton, f.o.b. cars, Detroit:

Hvy. melting and shov. steel	\$13.00 to \$13.50
Borings and short turnings	9.00 to 9.50
Long turnings	8.00 to 8.50
No. 1 machinery cast	14.00 to 15.00
Automobile cast	19.00 to 20.50
Hydral. comp. sheets	12.25 to 12.75
Stove plate	11.00 to 12.00
No. 1 busheling	10.00 to 10.50
Sheet clippings	8.00 to 8.50
Flashings	10.75 to 11.25

Adopts Simplified Brands for Sheet Steel

The American Sheet & Tin Plate Co., Pittsburgh, has adopted a new single brand for its products. The new brand will be applied in white on black sheets and in black on galvanized sheets. Trade names and grade designations will not be included within the brand hereafter, but will be placed below the brand in plain letters. When Keystone copper steel is used the fact will be indicated by a large Keystone symbol placed back of the branding.

The number of electric hoists ordered in September, according to the records of the Electric Hoist Manufacturers Association, E. Donald Tolles, secretary, 165 Broadway, New York, showed an increase of 11.2 per cent over August. In value orders showed a 26.7 per cent increase. Shipments fell off 10.5 per cent from August. The association will meet Nov. 22 at the Hotel McAlpin, New York.

Semi-Finished Steel, Raw Materials, Bolts and Rivets

Mill Prices of Semi-Finished Steel

F.o.b. Pittsburgh or Youngstown

Billets and Blooms

	Per Gross Ton
Rerolling, 4-in. and over.....	*\$33.00
Rerolling, under 4-in. to and including 1 1/4-in.	34.00
Forging	38.00

Sheet Bars

	Per Gross Ton
Open-hearth or Bessemer.....	\$33.00

*Cleveland mill base on large billets, slabs and sheet bars is \$33.

Slabs

	Per Gross Ton
8 in. x 2 in. and larger.....	\$33.00
Smaller than 8 in. x 2 in.	34.00

Skelp

	Per Lb.
Grooved	1.90c. to 2.00c.
Sheared	1.90c. to 2.00c.
Universal	1.90c. to 2.00c.

Wire Rods

	Per Gross Ton
*Common soft, base.....	\$42.00
Screw stock	\$5.00 per ton over base

*Chicago mill base is \$43. Cleveland mill base, \$42.

Prices of Raw Material

Ores

Lake Superior Ores, Delivered Lower Lake Ports

	Per Gross Ton
Old range Bessemer, 51.50% iron.....	\$4.55
Old range non-Bessemer, 51.50% iron.....	4.40
Mesabi Bessemer, 51.50% iron.....	4.40
Mesabi non-Bessemer, 51.50% iron.....	4.25
High phosphorus, 51.50% iron.....	4.15
Foreign Ore, c.i.f. Philadelphia or Baltimore	Per Unit
Iron ore, low phos., copper free, 55 to 58% iron in dry Spanish or Algerian.....	10.00c.
Iron ore, Swedish, average 66% iron.....	9.25c. to 9.50c.

Manganese ore, washed, 52% manganese, from the Caucasus.....	38c.
Manganese ore, Brazilian, African or Indian, basic 50%	37c. to 38c.
Tungsten ore, high grade, per unit, in 60% concentrates	\$10.90 to \$11.25

Chrome ore, 45 to 50% Cr ₂ O ₃ , crude, c.i.f. Atlantic seaboard	\$22.00 to \$24.00
Molybdenum ore, 85% concentrates of MoS ₂ , delivered	50c. to 55c.

Coke

	Per Net Ton
Furnace, f.o.b. Connellsville prompt	\$2.90 to \$3.00
Foundry, f.o.b. Connellsville prompt	3.75 to 4.85
Foundry, by-product, Ch'go ovens.....	8.00
Foundry, by-product, New England, del'd	11.00
Foundry, by-product, Newark or Jersey City, delivered.....	9.00 to 9.40
Foundry, Birmingham.....	5.00
Foundry, by-product, St. Louis, f.o.b. ovens	8.00
Foundry by-prod., del'd St. Louis.....	9.00

Coal

	Per Net Ton
Mine run steam coal, f.o.b. W. Pa. mines	\$1.40 to \$1.80
Mine run coking coal, f.o.b. W. Pa. mines	1.50 to 1.75
Gas coal, 3/4-in., f.o.b. Pa. mines.....	2.00 to 2.10
Mine run gas coal, f.o.b. Pa. mines.....	1.75 to 1.90
Steam slack, f.o.b. W. Pa. mines.....	60c. to 80c.
Gas slack, f.o.b. W. Pa. mines.....	90c. to \$1.00

Ferromanganese

	Per Gross Ton
Domestic, 80%, furnace or seab'd.....	\$105.00
Foreign, 80%, Atlantic or Gulf port, duty paid	105.00

Spiegeleisen

	Per Gross Ton Furnace
Domestic, 19 to 21%.....	\$33.00
Domestic, 16 to 19%.....	32.00

Electric Ferrosilicon

	Per Gross Ton Delivered
50%	\$83.50 to \$88.50
75%	130.00 to 140.00
	Per Gross Ton Furnace
10%	\$35.00
11%	37.00
12%	\$39.00
14 to 16%	45.00

Bessemer Ferrosilicon

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	\$30.00
10%	32.00
11%	32.00
12%	\$34.00

Silvery Iron

	Per Gross Ton
F.o.b. Jackson County, Ohio, Furnace	\$23.00
6%	24.00
7%	25.00
8%	25.00
9%	26.00
10%	\$28.00
11%	30.00
12%	32.00

Other Ferroalloys

Ferrotungsten, per lb., contained metal del'd	95c. to 98c.
Ferrocromium, 4 to 6% carbon and up, 65 to 70% Cr., per lb. contained Cr. delivered, in carloads.....	11.00c.
Ferrovanadium, per lb. contained vanadium, f.o.b. furnace.....	\$3.15 to \$3.65
Ferrocobalt, 15 to 18%, per net ton, f.o.b. furnace, in carloads.....	\$200.00
Ferrophosphorus, electric or blast furnace material, in carloads, 18% Rockdale, Tenn., base, per gross ton.....	\$91.00
Ferrophosphorus, electric 24%, f.o.b. Anniston, Ala., per gross ton.....	\$122.50

Fluxes and Refractories

Fluorspar

	Per Net Ton
Domestic, 85% and over calcium fluoride, not over 5% silica, gravel, f.o.b. Illinois and Kentucky mines.....	\$17.00 to \$18.00
No. 2 lump, Illinois and Kentucky mines.....	18.00
Foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Atlantic port, duty paid.....	16.00
Domestic, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2 1/2% silica, f.o.b. Illinois and Kentucky mines.....	32.50

Fire Clay

	Per 1000 f.o.b. Works
First Quality	\$43.00 to \$46.00
Second Quality	\$35.00 to \$38.00
Pennsylvania	43.00 to 46.00
Maryland	50.00 to 65.00
New Jersey	43.00 to 46.00
Ohio	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Illinois	43.00 to 46.00
Ground fire clay, per ton	7.00

Silica Brick

	Per 1000 f.o.b. Works
Pennsylvania	\$43.00
Chicago	52.00
Birmingham	50.00
Silica clay, per ton.....	\$8.50 to 10.00

Magnesite Brick

	Per Net Ton
Standard sizes, f.o.b. Baltimore and Chester, Pa.....	\$65.00
Grain magnesite, f.o.b. Baltimore and Chester, Pa.....	40.00
Standard size	45.00

Chrome Brick

	Per Net Ton
Standard size	\$45.00

Mill Prices of Bolts, Nuts, Rivets and Set Screws

Bolts and Nuts

	Per 100 Pieces
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)	
	Per Cent Off List
*Machine bolts	70
*Carriage bolts	70
Lag bolts	70
Plow bolts, Nos. 1, 2, 3 and 7 heads.....	70
Hot-pressed nuts, blank or tapped, square.....	70
Hot-pressed nuts, blank or tapped, hexagons.....	70
C.p.c. and t. square or hex. nuts, blank or tapped	70
Washers*	7.00c. to 6.75c. per lb. off list

*F.o.b. Chicago, New York and Pittsburgh.
*Bolts with rolled thread up to and including 1/2 in. x 6 in. take 10 per cent lower list prices.

Bolts and Nuts

	Per Cent Off List
Semi-finished hexagon nuts.....	70
Semi-finished hexagon castellated nuts, S.A.E.....	70
Stove bolts in packages, Pittsburgh.....	80, 10 and 2 1/2
Stove bolts in packages, Chicago.....	75, 20, 10 and 5
Stove bolts in bulk, Pittsburgh.....	80, 10 and 5
Stove bolts in bulk, Chicago.....	75, 20, 10, 5 and 2 1/2
Tire bolts	60, 5 and 5

Discounts of 70 per cent off on bolts and nuts applied on carload business. For less than carload orders discounts of 55 to 60 per cent apply.

Large Rivets

	Base Per 100 Lb.
(1/2-In. and Larger)	
F.o.b. Pittsburgh or Cleveland.....	\$2.90
F.o.b. Chicago	3.00

Small Rivets

	Per Cent Off List
(1/16-In. and Smaller)	
F.o.b. Pittsburgh	70 and 10
F.o.b. Cleveland	70 and 10
F.o.b. Chicago	70 and 10

Cap and Set Screws

(Freight allowed up to but not exceeding 50c. per 100 lb. on lots of 200 lb. or more)	
	Per Cent Off List
Milled cap screws	80, 10 and 10
Milled standard set screws, case hardened.....	80 and 10
Milled headless set screws, cut thread.....	80
Upset hex. head cap screws, U.S.S. thread.....	85 and 5
Upset hex. cap screws, S.A.E. thread.....	85 and 5
Upset set screws.....	80, 10 and 10
Milled studs	70 and 5

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*Boots
In Plates
Single*

Chicago

Iron and Steel Markets Take on Renewed Strength—Pig Iron Up 50c.—Car Inquiries Larger

CHICAGO, Oct. 23.—Practically every branch of the Western iron and steel market has taken a stronger position in the past week. Prices for plates, shapes and bars are firm, and the circle of buyers which has been successful in placing orders at 2c. per lb., Chicago, is rapidly narrowing. Pig iron has been advanced 50c. to \$19 a ton., local furnace, and sales for delivery in the first quarter are heavy. Cold-rolled strip has been advanced \$2 a ton, and producers expect to announce in a few days higher quotations on sheets.

Specifications for finished steel, after the drop of a week ago, are again heavier than shipments, and sales are a trifle above the average for the past 12 weeks. An upturn in demand from manufacturers of automobiles is noted, but schedules make it appear that output, though down only a small percentage, will not again reach the proportions of early October until new models are put in production about the middle of November. Frame makers are scheduled to resume at nearly capacity output about the third week of next month.

Structural shops have backlogs fully 20 per cent heavier than a year ago, and the outlook is favorable, since the slackening in building operations appears to affect principally those structures which do not make heavy use of steel.

The Rock Island has added 1000 gondolas and 250 flat cars to its inquiry of several days ago for 1500 box and stock cars.

Pig Iron.—Northern foundry iron has been advanced 50c. a ton to \$19 for the No. 2 grade. Sales for 1929 delivery are large, and the trade estimates that not less than 40 per cent of first quarter requirements have been covered. A melter west of Chicago has ordered 1200 tons for delivery after the turn of the year. A user in Muskegon, Mich., has contracted for five boat-loads to be shipped from Lake Erie ports. The first cargo, 3300 tons of silvery from Buffalo, has been unloaded. A Buffalo seller will ship another cargo of silvery and one of foundry iron and a furnace at Toledo will send two boat-loads of foundry iron. Sales of charcoal iron are unusually active at \$24 a ton, furnace. A shortage exists in several grades. Southern iron prices are strong, and there is talk of an advance to \$17, Birmingham. Although first quarter books in silvery have not been officially opened, it is said that protection at present prices will be extended. Prices are strong, and an advance of \$1 a ton is a possibility. Shipments of Northern iron are heavier than in September, and prompt deliveries are demanded.

Prices per gross ton at Chicago:

N'th'n No. 2 fdy., sil. 1.75 to 2.25..	\$19.00
N'th'n No. 1 fdy., sil. 2.25 to 2.75..	19.50
Malleable, not over 2.25 sil.....	19.00
High phosphorus	19.00
Lake Super. charcoal, sil. 1.50.....	27.04
So'th'n No. 2 fdy. (all rail).....	22.26
Low phos., sil. 1 to 2, copper free	\$29.00 to 29.50
Silvery, sil. 8 per cent.....	29.79
Bess, ferrosilicon, 14-15%.....	46.79

Prices are delivered consumers' yards except on Northern foundry, high phosphorus and malleable, which are f.o.b. local furnace, not including an average switching charge of 61c. per gross ton.

Ferroalloys.—Books have been opened on 50 per cent ferrosilicon for 1929 delivery at \$83.50 a ton, deliv-

ered. Car lot orders are priced at \$88.50. Forward contracting is active, fully six weeks earlier than a year ago. The first half price for ferromanganese is announced at \$105 a ton, seaboard. Buyers are showing some interest in future requirements. Spiegeleisen is steady at \$32 to \$33 a ton, Hazard, Pa., for the 19 to 21 per cent grade. A user in this district has closed for 600 tons for delivery next year.

Prices delivered Chicago: 80 per cent ferromanganese, \$112.56; 50 per cent ferrosilicon, \$83.50 to \$87.50; spiegeleisen, 19 to 21 per cent, \$40.76.

Plates.—Railroad car buying prospects are brighter as a result of an inquiry by the Rock Island for 2750 cars. The trade is expecting an inquiry from the Missouri Pacific for 3000 cars. Inquiries now before the trade, plus the 3000 cars which seem reasonably assured, call for not less than 120,000 tons of steel. In addition to this tonnage, steel will be needed by the Chicago, Burlington & Quincy and the Chicago, Indianapolis & Louisville for miscellaneous cars to be built in the shops of these roads. Specifications from car shops are small, covering only miscellaneous needs for small car orders placed in recent months. Need for plates in oil fields on the Pacific Coast and in the Southwest is more urgent. A Chicago mill has taken two orders for more than 5000 tons of oil storage tank plates for delivery in the Southwest. There is still 5000 tons on inquiry in that part of the country, and in addition several oil producing companies in the West will buy an aggregate of 4000 tons. A California oil pipe line will take 50,000 tons. Chicago plate mills are engaged at close to 80 per cent of capacity. Specifications from pipe makers are light; legal matters are being arranged that will release a large tonnage against contracts recently placed. Prices are firm at 2c. to 2.10c., Chicago.

Mill prices on plates, per lb.: 2c. to 2.10c. base Chicago.

Bars.—Specifications for mild steel bars are heavy, and deliveries from several Chicago mills have been set back about one week. Following the drop of a week ago, releases from manufacturers of automobiles are

larger, but they have not regained the ground previously lost. Forgers in the Chicago area are taking steel to meet full capacity operations. Although orders for automobile parts are lighter, there is an increasing demand for forgings from builders of cranes and construction machinery such as will be used in flood control work in the Mississippi River valley. New business in soft steel bars is measurably larger under the influence of several sizable fourth quarter contracts placed by railroads. Prices remain firm at 2c. to 2.10c. per lb., Chicago. With contracting well out of the way, producers are attempting to narrow the circle of buyers who are quoted less than 2.10c. The iron bar market is quiet both in new buying and specifications. Spot purchases of alloy steel bars are in good volume, but backlogs are growing lighter. Specifications from the automobile trade are heavier, but not equal to the rate in the early weeks of October. New orders for rail steel bars are fully equal to shipments, and both local mills continue to operate on a double turn basis. The bed trade, which usually curtails output at this time of the year, is still taking steel in good tonnage. Deliveries of rail steel bars are not better than four weeks on the average, and prices are firm.

Mill prices per lb.: Soft steel bars, 2c. to 2.10c., base, Chicago; common bar iron, 2c. to 2.10c., base, Chicago; rail steel bars, 1.95c., base, Chicago Heights mill.

Warehouse Business.—Shipments have gradually expanded for several weeks and now are measurably larger than in September. Prices are steady.

Cast Iron Pipe.—This market continues dull in the absence either of contractors' awards or public lettings. Several contractors' jobs are in the making, but not much can be expected from municipalities until after the November elections, when a number of bond issues will be voted on. Private buyers find that their needs are covered by scattered orders for a few lengths. Deliveries to the northern part of the country are in good volume, and backlogs resulting from orders from this section are rapidly dwindling. Deliveries are prompt on practically all sizes. Prices for small lots are steady at \$35 to \$37 a ton, Birmingham, for diameters 6 in. and larger. The Lynchburg Foundry Co. is low bidder at Milwaukee at \$36.75, Birmingham, on 100 tons of 8-in., Class C, pipe. This is equivalent to \$45.25, delivered.

Prices per net ton, deliv'd Chicago: Water pipe, 6-in. and over, \$43.20 to \$45.20; 4-in., \$47.20 to \$49.20; Class A and gas pipe, \$4 extra.

Cold-Rolled Strip.—Prices have been advanced \$2 a ton, making current quotations 2.85c. to 2.90c. per lb., Cleveland. The freight rate to Chicago is 30c. Specifications, though somewhat lighter than in previous weeks, are about equal to shipments, and deliveries are not better than three weeks.

Reinforcing Bars.—The largest award is 600 tons of rail steel bars for

a housing project in Chicago. Active projects are fully 50 per cent heavier than in September. Some of this prospective business is accounted for by the revival of several old projects. A liberal amount of small work is being let. Backlogs afford five to seven weeks' work. Pressure for deliveries is insistent as cold weather approaches, but shops are meeting requirements except when delayed by the lengthened deliveries from mills. Prices remain unstable, with a leaning toward the weak side, this being especially true of reinforcing bars made from billets.

Hot-Rolled Strip.—Revisions in prices have been made, and quotations now are 2.10c. per lb., Chicago, for widths under 6 in. and 2c. for 6 in. and wider. Shipments from mills are holding up well; deliveries average two weeks.

Structural Material.—Awards during the week totaled 2200 tons. Fresh inquiry is for 4000 tons. Dullness in lettings in recent weeks is now being felt by shops that find backlogs materially reduced. Anxiety to book tonnage is leading to keener competition, with the result that the gain in prices in the early part of the fall has disappeared. Building operations are curtailed, but more generally in the classes of structures that do not call for heavy tonnages of steel. Of special interest is the growing demand for industrial types of buildings. Contracts for steel by fabricating shops are small, it being evident that structural material will be purchased as jobs are taken. Deliveries range from two to five weeks. Prices are steady at 2c. to 2.10c., Chicago.

Mill prices on plain material, per lb.: 2c. to 2.10c. base, Chicago.

Wire Products.—Little change has taken place in this market in the past week. Releases by the manufacturing trade hold at a steady rate, but needs of the jobbers are small and uncertain. Mill output continues larger than shipments, as producers round out and enlarge stocks.

Rails and Track Supplies.—A Western railroad has entered an order for 3000 tons of standard-section rails for

immediate delivery. Backlogs are measurably smaller, but output remains unchanged. Inquiry for rails before the trade is marking time. Several railroads are preparing to come into the market for large tonnages. Orders for track accessories are unusually light and inquiry now in the market is small in total. Users of light rails have entered orders for several carloads.

Prices f.o.b. mill, per gross ton: Standard-section open-hearth and Bess. rails, \$43; light rails, rolled from billets, \$36. Per lb.: Standard railroad spikes, 2.80c.; track bolts with square nuts, 3.80c.; steel tie plates, 2.15c.; angle bars, 2.75c.

Sheets.—Mills are bringing a substantial volume of business to the mills. Prices are so strong that in the minds of many in the trade a \$2 a ton advance is near at hand. Specifications continue in sufficient volume to support hot mills at a shade under capacity. Deliveries range from four to five weeks on all grades except box annealed, which can be had in three to four weeks. There is a noticeable drop in demand from the roofing trade. This has come unusually early this year and is accounted for by the lack of demand in rural districts and the fact that manufacturers had built heavy stocks in anticipation of the fall trade.

Base prices per lb., deliv'd from mill in Chicago: No. 24 black sheets, 2.90c.; No. 24 galv., 3.65c.; No. 10 blue ann'd, 2.15c. Deliv'd prices at other Western points are equal to the freight from Gary plus the mill prices, which are 5c. per 100 lb. lower than Chicago delivered prices.

Coke.—Prices are firm at \$8 a ton, f.o.b. local ovens. Shipments have grown heavier in the week.

Bolts, Nuts and Rivets.—Prices for these commodities are firm. Small rivets are quoted at 70 and 10 to 70 per cent off list, depending on the size of orders. Specifications are heavier from a wide circle of users.

Old Material.—The Chicago scrap market is strong, notwithstanding that several of the light tonnage grades are coming out on tracks faster than demand warrants. Dealers are said to have paid as high as \$14.75 a gross ton, delivered, for heavy melting steel, and a producer of this grade has been offered above \$15 for a round tonnage of strictly first grade material. Mills are freely offering to take this grade at \$14.50, delivered. On the other hand, steel axles and couplers and knuckles often appear as distress tonnage and can be sold only in outlying parts of the district. In some quarters there is a move to buy further in advance; a user of short rails is willing to place orders for requirements for the next three months. Higher prices have released a considerable quantity of scrap, and dealers, in an effort to move it rapidly, have shipped to mills faster than the cars can be unloaded, with the result that users have been forced to limit consignments. It is observed by some that the inrush of scrap does not necessarily indicate a surplus, but rather that reserves usually on hand at this time of the year are being rapidly reduced and that the potential supply is already below normal. In-

cluded among railroad lists is 5000 tons offered by the Burlington and 1000 tons of relaying rails that will be sold by the St. Paul.

Prices deliv'd Chicago district consumers:

Per Gross Ton

Basic Open-Hearth Grades:

Heavy melting steel.....	\$14.00 to \$14.50
Shoveling steel.....	14.00 to 14.50
Frogs, switches and guards, cut apart, and misc. rails	15.50 to 16.00
Hydraul. compressed sheets	12.25 to 12.75
Drop forge flashings.....	9.50 to 10.00
Forg'd; cast and r'l'd steel carwheels	17.25 to 17.75
Railr'd tires, charg. box size	17.25 to 17.75
Railr'd leaf spring cut apart	17.25 to 17.75

Acid Open-Hearth Grades:

Steel couplers and knuckles	15.75 to 16.25
Coil springs.....	18.25 to 18.75

Electric Furnace Grades:

Axle turnings.....	14.00 to 14.50
Low phos. punchings.....	16.00 to 16.50
Low phos. plate, 12 in. and under	15.50 to 16.00

Blast Furnace Grades:

Axle turnings.....	11.00 to 11.50
Cast iron borings.....	11.00 to 11.50
Short shoveling turnings.....	11.00 to 11.50
Machine shop turnings....	6.75 to 7.25

Rolling Mill Grades:

Iron rails.....	14.75 to 15.25
Rerolling rails.....	16.50 to 17.00

Cupola Grades:

Steel rails less than 3 ft..	17.25 to 17.75
Angle bars, steel.....	16.50 to 17.00
Cast iron carwheels.....	13.75 to 14.00

Malleable Grades:

Railroad	15.25 to 15.75
Agricultural	12.50 to 13.00

Miscellaneous:

*Relaying rails, 56 to 60 lb.	23.00 to 25.00
*Relaying rails, 65 lb. and heav.	26.00 to 31.00

Per Net Ton

Rolling Mill Grades:

Iron angles and splice bars	14.50 to 15.00
Iron arch bars and transoms	20.50 to 21.00
Iron car axles.....	25.50 to 26.00
Steel car axles.....	16.00 to 16.50
No. 1 railroad wrought...	12.75 to 13.25
No. 2 railroad wrought...	12.50 to 13.00
No. 1 busheling.....	11.00 to 11.50
No. 2 busheling.....	6.00 to 6.50
Locomotive tires, smooth..	13.00 to 13.50
Pipes and flues.....	9.50 to 10.00

Cupola Grades:

No. 1 machinery cast.....	15.50 to 16.00
No. 1 railroad cast.....	14.50 to 15.00
No. 1 agricultural cast....	14.00 to 14.50
Stove plate.....	11.75 to 12.25
Grate bars.....	12.50 to 13.00
Brake shoes.....	11.75 to 12.25

*Relaying rails, including angle bars to match, are quoted f.o.b. dealers' yards.

Former Sanderson Company Acquires New Plant

Following the recent purchase of the merchant iron and steel business of the E. P. Sanderson Co., Cambridge, Mass., by Joseph T. Ryerson & Son, Inc., Chicago, the Sanderson company is closing negotiations for the purchase of the neighboring plant of the American Net & Twine Co. and will occupy it for departments of business not included in the sale to the Ryerson company. The Sanderson organization, however, will not operate under the old name, as the Ryerson purchase included the name as well as the good will of the company. The Sanderson heavy hardware and blacksmithing departments and the Cutter & Wood division, devoted to mill supplies, will have increased facilities in the new plant.

Warehouse Prices, f.o.b. Chicago

Base per Lb.

Plates and structural shapes.....	3.10c.
Soft steel bars.....	3.00c.
Reinforc'g bars, billet steel, 2.15c. to 2.50c.	
Reinforc'g bars, rail steel, 2.00c. to 2.50c.	
Cold-fin. steel bars and shafting—	
Rounds and hexagons.....	3.60c.
Flats and squares.....	4.10c.
Bands	3.65c.
Hoops	4.15c.
Black sheets (No. 24).....	3.80c.
Galv. sheets (No. 24).....	4.65c.
Blue ann'l'd sheets (No. 10).....	3.35c.
Spikes, stand. railroad.....	3.55c.
Track bolts.....	4.55c.
Rivets, structural.....	3.60c.
Rivets, boiler	3.60c.

Per Cent Off List

Machine bolts.....	60
Carriage bolts.....	60
Coach or lag screws.....	60
Hot-pressed nuts, sq., tap. or blank...	60
Hot-pressed nuts, hex., tap. or blank...	60
No. 8 black ann'l'd wire, per 100 lb..	\$3.30
Com. wire nails, base per keg.....	3.10
Cement c'd nails, base per keg.....	3.10

Philadelphia

Eastern Mills Still Engaged at High Rate—Reading Divides 30,000-Ton Rail Order—Scrap Higher

PHILADELPHIA, Oct. 23.—Eastern mills continue a high rate of operation, fortified by a heavy volume of specifications against fourth quarter contracts. Bar and plate prices are firm, and the sheet market is strong except for some recently reported concessions of \$1 a ton on black sheets. Structural mills are in a better position as to tonnage than in some months. Plate producers have quoted on an inquiry from a local shipyard for 13,500 tons of plates required for four vessels, awards of which are pending.

Distribution of the 160,000 tons of rails required for next year by the Pennsylvania Railroad has not yet been made. The Reading has placed 30,000 tons of rails, of which 24,000 tons went to the Bethlehem Steel Co. and 6000 tons to the Carnegie Steel Co.

Iron and steel scrap prices continue to advance. A large eastern Pennsylvania plate mill is understood to have closed on a sizable tonnage of No. 1 heavy melting steel at \$16.50 per ton, delivered, an advance of 50c.

Pig Iron.—Sellers are asking \$20.50 per ton, base, on small lots of foundry iron, but \$20, base, is still obtainable on desirable tonnage. Foundries are accepting full shipments on their contracts. Interest in first quarter tonnage is developing; sellers are asking \$20.50 per ton, base, for that delivery. About 20,000 tons of basic iron wanted for first quarter delivery by a large eastern Pennsylvania consumer has not been placed. Low phosphorus demand is improving, and prices are firm. No decision on resuming operation has been reached by the northern New York producer of low phosphorus iron; its yard stocks have been greatly reduced.

Prices per gross ton at Philadelphia:

East. Pa. No. 2, 1.75 to 2.25 sil.	\$20.76 to \$21.26
East. Pa. No. 2X, 2.25 to 2.75 sil.	21.26 to 21.76
East. Pa. No. 1X, 2.17 to 2.75 sil.	21.76 to 22.26
Basic (del'd east. Pa.)	19.75
Gray forge	19.75 to 20.25
Malleable	21.00 to 21.50
Stand. low phos. (f.o.b. N. Y. State furnace)	22.00 to 23.00
Cop. br'g low phos. (f.o.b. furnace)	23.00 to 23.50
Va. No. 2 plain, 1.75 to 2.25 sil.	24.54
Va. No. 2X, 2.25 to 2.75 sil.	25.04

Prices, except as specified otherwise, are deliv'd Philadelphia. Freight rates: 76c. to \$1.64 from eastern Pennsylvania furnaces; \$4.54 from Virginia furnaces.

Billets.—Makers are quoting \$34 per ton, Pittsburgh, on small lots of rerolling billets, but on larger tonnages \$33, Pittsburgh, applies. Forging grade is quoted at \$38, Pittsburgh.

Bars.—Mills have specifications to engage them at their present rate of operation for four to five weeks. Prices are firm at 2c., Pittsburgh, or 2.32c., Philadelphia, on new business, with deliveries on contracts for this quarter at 1.90c. and 1.95c., Pittsburgh.

Shapes.—Operating rates of producers in eastern Pennsylvania are high and specifications on contracts are in good volume. Prices are being maintained quite firmly at 2.05c. to 2.10c., f.o.b. nearest mill, or 2.11c. to 2.16c., Philadelphia, based on Pencoyd, Pa. Fabricating shops are well occupied with contracts and are bidding on

a number of local projects of size, including a new plant for the Atwater Kent Mfg. Co., the Reading Commercial Building and a hospital. Several thousand tons of material will be required for grade crossing elimination on the Reading Railroad, near Philadelphia.

Plates.—A Camden, N. J., shipyard has asked for prices on 13,500 tons of plates required for four vessels for the American Express Line, on which it is bidding. Quotations on new business are firm at 2.15c., Coatesville. Even preferred buyers are no longer offered tonnage at 2.10c., Coatesville, or 2.20c., Philadelphia. Specifications against contracts are heavy, and mills report a good volume of new business in prospect.

Sheets.—Blue annealed prices are firm at 2c., Pittsburgh, or 2.32c., Philadelphia, and on small tonnages mills are beginning to obtain 2.10c., Pittsburgh. This strength is partly balanced by reports that the 10c. extra on wide sheets is not always obtained when tonnage for a preferred customer is under consideration. Black sheets are quoted at 2.75c., Pittsburgh, or 3.17c., Philadelphia, and a few concessions of \$1 a ton are reported to have been made recently. Galvanized sheets are firm at 3.50c., Pittsburgh, or 3.82c., Philadelphia, and some makers are considering an advance.

Warehouse Business.—October will

Warehouse Prices, f.o.b. Philadelphia

	Base per Lb.
Plates, ¼-in. and heavier	2.70c.
Plates, ⅝-in.	2.90c.
Structural shapes	2.70c.
Soft steel bars, small shapes, iron bars (except bands)	2.30c.
Round-edge iron	3.50c.
Round-edge steel, iron finished 1½ x 1½ in.	3.50c.
Round-edge steel, planished	4.30c.
Reinforc. steel bars, sq. twisted and deform.	2.60c. to 2.80c.
Cold-fin. steel, rounds and hex.	3.45c.
Cold-fin. steel, sq. and flats	3.95c.
Steel hoops	3.60c.
Steel bands, No. 12 to ⅝-in., inclus.	3.35c.
Spring steel	5.00c.
*Black sheets (No. 24)	3.85c.
†Galvanized sheets (No. 24)	4.60c.
Blue ann'd sheets (No. 10)	3.00c.
Diam. pat. floor plates—	
¼-in.	5.30c.
⅝-in.	5.50c.
Rails	3.90c.
Swedish iron bars	6.60c.

*For 50 bundles or more; 10 to 49 bun., 4.10c. base; 1 to 9 bun., 4.35c. base.
†For 50 bundles or more; 10 to 49 bun., 4.95c. base; 1 to 9 bun., 5.30c. base.

evidently show about the same volume of purchasing from warehouse stocks as September. Prices are firm. Jobbers who stock reinforcing bars are endeavoring to eliminate the concessions from 2.80c. per lb., which have been common for a number of months.

Imports.—In the week ended Oct. 20 imports of pig iron were only 125 tons, of which 75 tons was from Norway and 50 tons from Sweden. Ore arrivals were confined to 1960 tons of manganese ore from British India. Steel imports were 75 tons of structural shapes from Germany and 27 tons from France, 99 tons of steel bars and 30 tons of billets from Sweden, 39 tons of wire rods from Germany and 18 tons of steel bands from France.

Old Material.—A large eastern Pennsylvania plate mill is understood to have bought a sizable tonnage of No. 1 heavy melting steel at \$16.50 per ton, delivered, from two Eastern brokers. All grades of scrap continue strong, and it is said by sellers in this district that higher prices in western Pennsylvania should immediately be reflected in this market. Specification pipe has been bought at \$15.50 per ton and couplers and knuckles at \$18 per ton, delivered. Blast furnace scrap is rather inactive, but one broker is paying \$11 per ton, delivered to Swedeland, Pa.

Prices per gross ton delivered consumers' yards, Philadelphia district:

No. 1 heavy melting steel	\$16.00 to \$16.50
Scrap T rails	\$15.50 to 16.00
No. 2 heavy melting steel	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Bundled sheets (for steel works)	11.50 to 12.00
Machine shop turnings (for steel works)	11.50 to 12.00
Heavy axle turnings (or equiv.)	12.50 to 13.50
Cast borings (for steel works and roll. mill)	11.00 to 11.50
Heavy breakable cast (for steel works)	16.50 to 17.00
Railroad grate bars	13.00 to 13.50
Stove plate (for steel works)	13.00
No. 1 low phos., hvy., 0.04% and under	19.00 to 20.00
Couplers and knuckles	17.50 to 18.00
Roller steel wheels	17.00 to 17.50
No. 1 blast f'nace scrap	10.00 to 11.00
Wrot. iron and soft steel pipes and tubes (new specific.)	15.00 to 15.50
Shafting	19.00 to 20.00
Steel axles	22.00 to 23.00
No. 1 forge fire	12.50 to 13.00
Cast iron carwheels	16.50 to 17.00
No. 1 cast	17.00 to 17.50
Cast borings (for chem. plant)	14.50 to 15.00
Steel rails for rolling	15.50 to 16.00

Fabricated Steel Plate Orders Smaller

WASHINGTON, Oct. 23.—Orders for fabricated steel plates in September totaled 40,225 tons, or 50.4 per cent of the capacity of the plants of the 51 firms reporting to the Department of Commerce. August orders amounted to 47,245 tons, or 59.9 per cent of capacity. The September orders were distributed as follows: Oil storage tanks, 18,572 tons; refinery materials and equipment, 5021 tons; tank cars, 684 tons; gas holders, 1642 tons; blast furnaces, 386 tons; stacks and miscellaneous, 13,920 tons.

New York

Pig Iron and Finished Steel Gaining Strength—Sales of Bars at 2c. Increasing

NEW YORK, Oct. 22.—The pig iron market continues to show signs of strength. Gains in foundry melt are reflected in requests for deliveries ahead of those scheduled. An increasing number of orders for shipment in the current quarter are being placed by consumers who underestimated their requirements in contracting for this period. Close to 12,000 tons was sold in this territory during the week, most of it supplementary tonnage for delivery in the next two months. Sales of foundry iron continue to be made at \$17, base Buffalo, but a fair tonnage has been closed at an advance of 50c. a ton, some of it for deliveries extending into first quarter. As yet, however, buyers have shown little interest in their next year's requirements and producers are not pressing for business that far ahead. The General Electric Co. has bought 500 tons each for its Lynn and Pittsfield, Mass., plants and 1200 tons for Elmira, N. Y. The Eastern Malleable Iron Co. is inquiring for a total of 1000 tons of malleable for its Troy, N. Y., and Wilmington, Del., plants. The New Jersey Zinc Co., New York, is in the market for 200 tons of No. 1X. About 5000 tons of iron is pending, most of it for shipment in this quarter.

Prices per gross ton, delivered New York district:

Buffalo No. 2 fdy., sil. 1.75 to 2.25	\$21.91
*Buf. No. 2, del'd east. N. J.	20.28
No. 2, del'd east. N. J. tidewater	\$20.01 to 21.25
East. Pa. No. 2 fdy., sil. 1.75 to 2.25	20.89 to 22.02
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	21.39 to 22.52
East. Pa. No. 1X fdy., sil. 2.75 to 3.25	21.89 to 23.02

Freight rates: \$4.91 from Buffalo, \$1.39 to \$2.52 from eastern Pennsylvania.

*Price delivered to New Jersey cities having rate of \$3.28 a ton from Buffalo.

Plates, Shapes and Bars.—Steel bars mills are drawing sharper lines as to what buyers are entitled to the minimum prices. With contract customers covered for the quarter at 1.90c. and 1.95c., Pittsburgh, there has been virtually a withdrawal of the 1.90c. price, and a good many buyers find that they cannot do better than 2c. In plates and shapes, the strength of prices is not so marked, but a good many of the current transactions are at 2.27½c., New York, for plates and at 2.24½c., New York, for shapes, and only the largest buyers are openly getting lower quotations. Even in such cases the minimums are 2.22½c., New York, for plates and 2.19½c. for shapes. The price situation is apparently tending toward quotations of 2c., Pittsburgh, on all three products for first quarter. For Eastern plate and shape mills, this would mean 2.15c., f.o.b. mill, the present small-lot price. Specifications against fourth quarter contracts are in good volume. The first

three weeks of October brought in tonnages equal to those booked in the first three weeks of September, but as the last week of September was considerably ahead of other weeks of that month, and, as there is no prospect that ordering between now and Nov. 1 will be on such a large scale, it is fairly certain that the October total of steel orders in this district will be less than that of September.

Warehouse Prices, f.o.b. New York

	Base per Lb.
Plates and structural shapes	3.30c.
Soft steel bars, small shapes	3.25c.
Iron bars	3.24c.
Iron bars, Swed. charcoal	7.00c. to 7.25c.
Cold-fin. shafting and screw stock—	
Rounds and hexagons	3.50c.
Flats and squares	4.00c.
Cold-roll. strip, soft and quarter hard	5.15c. to 5.40c.
Hoops	4.50c.
Bands	4.00c.
Blue ann'd sheets (No. 10)	3.85c. to 3.90c.
Long terme sheets (No. 24)	5.60c. to 5.80c.
Standard tool steel	12.00c.
Wire, black annealed	4.50c.
Wire, galv. annealed	5.15c.
Tire steel, 1½ x ¼ in. and larger	3.30c.
Smooth finish, 1 to 2½ x ¼ in. and larger	3.65c.
Open-hearth spring steel, bases	4.50c. to 7.00c.

	Per Cent Off List
Machine bolts, cut thread:	
¾ x 6 in. and smaller	.60
1 x 30 in. and smaller	.50 to 50 and 10

	Per Cent Off List
Carriage bolts, cut thread:	
¾ x 6 in. and smaller	.60
¾ x 20 in. and smaller	.50 to 50 and 10

	Per Cent Off List
Coach screws:	
½ x 6 in. and smaller	.60
1 x 16 in. and smaller	.50 to 50 and 10

	Per 100 Ft.
Boller Tubes—	
Lap welded, 2-in.	\$17.33
Seamless steel, 2-in.	20.24
Charcoal iron, 2-in.	25.00
Charcoal iron, 4-in.	67.00

Discount on Welded Pipe		
Standard Steel—	Black	Galv.
¾-in. butt.	46	29
¾-in. butt.	51	37
1-3-in. butt.	53	39
2½-6-in. lap.	48	35
7 and 8-in. lap.	44	17
11 and 12-in. lap.	37	12
Wrought Iron—		
¾-in. butt.	5	+19
¾-in. butt.	11	+9
1-1½-in. butt.	14	+6
2-in. lap.	5	+14
3-6-in. lap.	11	+6
7-12-in. lap.	3	+16

Tin Plate (14 x 20 in.)		
	Prime	Seconds
Coke, 100 lb. base box	\$6.45	\$6.20
Charcoal, per Box—	A	AAA
IC	\$9.70	\$12.10
IX	12.00	14.25
IXX	13.90	16.00

Terne Plate (14 x 20 in.)		
IC—20-lb. coating	\$10.00 to \$11.00	
IC—30-lb. coating	12.00 to 13.00	
IC—40-lb. coating	13.75 to 14.25	

Sheets, Box Annealed—Black, C. R.		
	One Pass	Per Lb.
Nos. 18 to 20	3.60c. to 3.80c.	
No. 22	3.75c. to 3.95c.	
No. 24	3.80c. to 4.00c.	
No. 26	3.90c. to 4.10c.	
No. 28*	4.05c. to 4.25c.	
No. 30	4.30c. to 4.50c.	

Sheets, Galvanized		
		Per Lb.
No. 14	4.15c. to 4.35c.	
No. 16	4.00c. to 4.20c.	
No. 18	4.15c. to 4.35c.	
No. 20	4.30c. to 4.50c.	
No. 22	4.35c. to 4.55c.	
No. 24	4.50c. to 4.70c.	
No. 26	4.75c. to 4.95c.	
No. 28*	5.00c. to 5.20c.	
No. 30	5.40c. to 5.60c.	

*No. 28 and lighter, 36 in. wide, 20c. higher per 100 lb.

Steel for the new Chrysler Building, Lexington Avenue and Forty-second Street, New York, amounting to 16,000 to 17,000 tons, will probably be let within a week. The Harris Structural Steel Co. has been awarded 6000 tons of fabricated steel for New York subways. It appears that orders for about 20,000 tons of steel products, mostly plates, shapes and sheet steel piling, for the Brooklyn water tunnel will not be bought by the general contractor, Patrick McGovern, Inc., until about the first of the year. About 2500 tons of plates will be needed for 15 New York Central barges, on which the Dravo Contracting Co., Pittsburgh, is reported to be low bidder.

Mill prices per lb., deliv'd New York: Soft steel bars, 2.24c. to 2.34c.; plates, 2.22½c. to 2.32½c.; struc. shapes, 2.19½c. to 2.22½c.; bar iron, 2.14c.

Cast Iron Pipe.—Buying is limited to small lots of water pipe and it will be several weeks before the first of the inquiries appear on gas pipe for spring delivery. Several of the larger privately owned utility companies are understood to have estimates of spring requirements of gas pipe ranging from 5000 tons to as much as 20,000 tons. A few sizable tonnages of water pipe are in the market or in prospect. Dallas, Tex., is expected to call for new bids on about 25,000 tons of water pipe. Albany, N. Y., is planning to issue an inquiry soon after election, calling for about 50,000 tons of 48-in. pipe. This will be one of the largest single pipe orders placed in the United States in recent years. At the opening of bids on 14,000 tons of water pipe, by Warwick, R. I., on Oct. 16, the low bid was submitted by Herbert Kennedy Co., New York, representing the Pont-a-Mousson works in France. Award has not yet been made, and the town committee is studying all bids carefully. The Pont-a-Mousson works, which has not appeared recently as an active competitor for pipe tonnage in the United States, has booked some large contracts in foreign markets, including 50,000 tons of 32-in. pipe for Maracaibo, Venezuela and 14,000 tons for Caracas and other cities in that country, 14,000 tons from different Cuban cities and 4200 tons for Athens, Greece.

Prices per net ton, deliv'd New York: Water pipe, 6-in. and larger, \$35.60 to \$36.60; 4-in. and 5-in., \$40.60 to \$41.60; 3-in., \$50.60 to \$51.60; Class A and gas pipe, \$4 to \$5 extra.

Sheets and Strip.—The volume of specifications and new orders for sheets is surprisingly large in view of the recent widespread coverage. Black sheets are firm at 2.75c., Pittsburgh, galvanized are also firm at 3.50c., while blue annealed sheets are at 2c. for sizes up to 45 in. and 2.10c. for over that width. Local representatives of makers of hot and cold-rolled strip steel have received notices of price advances. On hot-rolled strip two base prices have been named—1.90c., Pittsburgh or Cleveland, on wider than 6 in. and 2c. on 6 in. and narrower. The advance on cold-rolled strip is \$2 a ton, making the new quo-

tation 2.85c., Pittsburgh or Cleveland.

Wire Products.—Some makers of wire nails have notified jobbers that hereafter the minimum is \$2.55, Pittsburgh, per keg. Preferred jobbers have been getting a \$2 concession from the open market price. An effort will be made by these mills to establish a \$2.65 price for dealers and consumers in carload lots.

Warehouse Business.—Based on sales in the first three weeks of this month, jobbers in this district report that October will be one of the best months of the year. Demand for structural steel from stock continues heavy, and there is a steady flow of business in black and galvanized sheets. Prices are becoming quite firm. Concessions on sheets are difficult to obtain except when the quantity differentials are applied.

Coke.—Standard furnace coke is strong at \$2.85 to \$3.05 per net ton, Connellsville, and it is becoming more difficult to place orders at the lower price. Standard foundry grade is also slightly stronger, but quotations still range from \$3.50 to \$3.75 per net ton, Connellsville. Standard brands are unchanged at \$4.85 per net ton, ovens, or \$8.56 per net ton, delivered to northern New Jersey, Jersey City and Newark, and \$9.44 per ton to New York and Brooklyn. By-product foundry coke prices are \$9 to \$9.40, Newark or Jersey City, and \$10.06, New York or Brooklyn.

Reinforcing Bars.—A terminal warehouse at Jersey City for the Delaware, Lackawanna & Western Railroad will require 8500 tons of reinforcing bars instead of from 2000 to 3000 as first reported, and is the largest job in this territory for some time. Reinforcing steel for the water tunnel extending through Manhattan from Yonkers to Brooklyn will probably not be bought until after the first of the year. The largest new project is a power plant at Amenia, N. Y.,

requiring about 660 tons. A considerable amount of work has been closed recently, and new inquiries are not coming out to replace the larger jobs in the aggregate of work in prospect. Prices are considered satisfactory.

Old Material.—Except for heavy breakable cast, buying prices of brokers are strong with a tendency to advance. Shipments of breakable cast on contracts have been heavy recently, so that consumers have adequate stocks of this grade and are not seeking prompt delivery on contracts. One consumer in New Jersey has reduced its price 50c. a ton. Specification pipe is being bought at \$15 per ton, delivered Lebanon, Pa., based on a recent purchase by a consumer at \$15.50 per ton. Brokers shipping blast furnace scrap to Swedeland, Pa., are paying \$11 per ton, delivered. No. 1 heavy melting steel is unchanged, although it is reported that a tonnage has been closed by an eastern Pennsylvania mill at \$16.50 per ton, delivered, which is a 50c. advance in the eastern Pennsylvania market.

Dealers' buying prices per gross ton, f.o.b. New York:

No. 1 heavy melting steel	\$12.00 to \$12.50
Heavy melting steel (yard)	8.75 to 9.50
No. 1 hvy. breakable cast	12.50 to 13.00
Stove plate (steel works)	8.75 to 9.00
Locomotive grate bars	9.25 to 10.25
Machine shop turnings	8.00 to 8.50
Short shoveling turnings	8.00 to 8.50
Cast borings (blast furn. or steel works)	7.00 to 7.50
Mixed borings and turnings	7.00 to 7.50
Steel car axles	18.00 to 18.50
Iron car axles	25.25 to 26.25
Iron and steel pipe (1 in. dia., not under 2 ft. long)	11.25
Forge fire	8.50 to 9.00
No. 1 railroad wrought	11.75 to 12.25
No. 1 yard wrot., long	10.75 to 11.25
Rails for rolling	11.50 to 12.00
Cast iron carwheels	13.00 to 13.50
Stove plate (foundry)	9.50 to 10.00
Malleable cast (railroad)	10.00 to 10.50
Cast borings (chemical)	11.25
<i>Prices per gross ton, deliv'd local foundries:</i>	
No. 1 machy. cast	\$17.00 to \$18.00
No. 1 hvy. cast (columns, bldg. materials, etc.)	cupola size
	15.00 to 16.00
No. 2 cast (radiators, cast boilers, etc.)	14.50 to 15.50

Cleveland

Slight Falling Off in Steel Demand—New Base Prices on Hot-Rolled Strip—Pig Iron Advanced

CLEVELAND, Oct. 23.—Some of the mills report a moderate and others quite a sharp falling off in specifications and still others are getting about as many orders as earlier in the month, but for smaller tonnages. A slowing down in the demand was to be expected after the heavy bookings late last month and early in October. Consumers are starting to get shipments against late September specifications, and many will not need to order additional material for some time. There is some recession in the demand for steel from the automotive industry. This is noticeable locally in lighter specifications for steel bars from forge shops. Detroit reports a well sustained demand this month from motor car companies, although it is expected that orders from this source will be more restricted during the next few weeks. There is not much activity in the building field or in other fields that might bring out good-sized orders for special work.

An order for half of a Texas pipe line requiring 6000 tons of plates has been placed with the Biggs Boiler Works, Akron. An Eastern mill will supply the steel. The Detroit, Toledo & Ironton Railroad is inquiring for 13,000 tons of rails.

The market has become well stabilized at recent prices. Outside mills are holding fairly firmly to 1.95c., Pittsburgh, for steel bars, plates and structural material and to 1.95c. to 2.05c. for steel bars when quoting on a Cleveland base. Local mills quote

steel bars at 1.90c., Cleveland. A leading Detroit automobile company which recently bought a round tonnage of steel bars from a Cleveland mill and which often has been able to get a price concession, is understood to have placed its order at 1.75c., Cleveland.

Pig Iron.—The features of the market are price advances on foundry and malleable iron by several of the Lake furnaces and inquiries for a round tonnage of basic iron, the supply of which is not plentiful. A north central Ohio steel plant, which recently was a buyer of basic, has again come in the market, this time for 15,000 to 20,000 tons. One producer has quoted \$17.50, and it seems doubtful whether this grade can be bought at a lower price. The inquiry for 3000 to 5000 tons of basic for the Alliance, Ohio, plant of American Steel Foundries is still pending. One Cleveland producer has opened its books for foundry and malleable iron for the first quarter at \$18, with full silicon differentials, for outside shipment and at \$18.50 for local delivery, a 50c. per ton advance, and has made the same advance for the remainder of the year and has taken some business at the new prices. Another has made the same advance, but is not seeking business, as its present commitments will carry it well through the first quarter. A 50c. a ton advance to \$19 has been made for Michigan delivery for the first quarter. One Lake furnace interest that recently advanced its price to \$18.50 for the coming quarter has made another 50c. advance to \$19 for the remainder of the year. Sales by Cleveland interests increased to 38,000 tons the past week; a large part of this business was for delivery this year. Recent price advances for the first quarter are, expected to have a tendency to cause some hesitation on the part of buyers until the prices are well tested. Two inquiries for low phosphorus iron, each for 2000 tons, are pending. While makers are asking \$27, Valley, for small lots, \$26.50 can still be done on round tonnages. Shipments continue heavy in the automotive and other fields aside from jobbing foundries, which are only moderately busy in this territory.

<i>Prices per gross ton at Cleveland:</i>	
N'th'n fdy., sil.	1.75 to 2.25 \$19.00
S'th'n fdy., sil.	1.75 to 2.25 22.25
Malleable	..... 19.00
Ohio silvery, 8 per cent.	..... 28.00
Basic Valley furnace	..... 17.00 to 17.50
Stand. low phos., V'ley fur.	\$26.50 to 27.00

Prices, except on basic and low phosphorus, are delivered Cleveland. Freight rates: 50c. from local furnaces; \$3 from Jackson, Ohio; \$6 from Birmingham.

Iron Ore.—Sales have dwindled the past week, and buying for shipment this season is practically over. The consumption of Lake ore during September was 4,607,963 gross tons, or a decrease of 153,011 tons, compared with August. This decrease is accounted for by the shorter month. The amount consumed in September last year was 4,089,493 tons. The amount at furnaces Oct. 1 was 29,707,911 tons and the amount on hand at furnaces and Lake Erie docks Oct. 1 was 35,808,367 tons, compared with 39,295,539

tons on the same date a year ago. Central district furnaces during September consumed 2,429,655 tons, an increase of 51,713 tons. Lake front furnaces used 2,016,566 tons, a decrease of 201,452 tons. All-rail furnaces consumed 91,698 tons, a decrease of 1481 tons, and Eastern furnaces used 70,044 tons, a decrease of 1791 tons. There were 161 furnaces using Lake ore in blast Sept. 30, an increase of six for the month. The late season ore movement promises to be heavy. With a promising outlook in the iron and steel industry, the two leading ore shippers have materially increased shipping orders with outside vessel companies.

Strip Steel.—Specifications for hot-rolled strip continue fairly heavy. The new card of extras has been rather generally adopted. Mills using these extras are quoting two base prices, 2c., Pittsburgh, for widths to 6 in., inclusive, and 1.90c. for strip over 6 in. The new card will not apply to much fourth quarter business, as most consumers are covered for the present quarter. Cold-rolled strip is firmer. One producer has announced 2.85c., Cleveland and Pittsburgh, as its minimum price and another has advanced to a flat 2.95c. price. However, some of the mills are still quoting 2.75c. for round lots.

Fluorspar.—The 50 per cent advance in the duty on gravel fluorspar, made by Presidential proclamation and effective Nov. 19, will, in the opinion of domestic producers, shut out of the Pittsburgh district foreign fluorspar used in the steel making industry. Imported fluorspar is shipped on a gross ton basis, but is figured on a net ton basis in the domestic market to conform with the method of marketing the domestic material. The advance increases the duty from \$5 to \$7.50 per net ton and covers fluorspar with 93 per cent and less of calcium fluoride, so that the increased duty applies only to the gravel fluorspar. Consumers in the Pittsburgh district use 10,000 to 12,000 tons of gravel fluorspar per annum, and competition for this business between the foreign and domestic grades frequently has had a tendency to depress the price of the latter. Previous to the announcement of the tariff advance, the gravel fluorspar market developed a firmer tone, with at least one producer holding for a \$1 a ton advance to \$18, mines. The price for next year has not yet been named.

Warehouse Prices, f.o.b. Cleveland

	Base per Lb.
Plates and struct. shapes.....	3.00c.
Soft steel bars.....	3.00c.
Reinforc. steel bars.....	2.25c. to 2.50c.
Cold-fin. rounds and hex.....	3.65c.
Cold-fin. flats and sq.....	4.15c.
Hoops and bands.....	3.65c.
Cold-finished strip.....	5.95c.
Black sheets (No. 24).....	3.50c.
Galvanized sheets (No. 24).....	4.25c.
Blue ann'l'd sheets (No. 10).....	3.35c.
No. 9 ann'l'd wire, per 100 lb.....	\$2.85
No. 9 gal. wire, per 100 lb.....	3.30
Com. wire nails, base per keg.....	2.85

*Net base, including boxing and cutting to length.

Sheets.—Specifications are heavy and some of the mills are having difficulty in satisfying delivery demands. On automobile body sheets, several mills are not promising shipments before Dec. 1. The market is firmer and little is heard of price concessions. Blue annealed sheets are out of line with plate prices, and, as a result, some consumers who ordinarily use plates are substituting sheets, as these in 3/16-in. in the narrower widths are \$4 a ton cheaper than corresponding plate material.

Cold-Finished Bars.—Orders for screw machine parts for the new models of Chevrolet cars are being placed and these are stimulating the demand for cold-finished bars. Business as a whole is less than in September, as the price advance brought out liberal specifications late last month against expiring contracts. Prices are firmer.

Semi-Finished Steel.—The leading local producer announces that it has sold its entire merchant output for the fourth quarter at the prices recently named. Specifications are heavy against contracts.

Wire Products.—Nails and wire are in light demand. Regular prices appear to be well maintained in this territory.

Reinforcing Bars.—Small lots are in fair demand, but otherwise the market is dull. Prices are irregular. For mill orders, 1.85c., Pittsburgh, evidently can still be done.

Warehouse Business.—The volume of business shows some decline. Orders are as numerous as earlier in the month, but for smaller lots. Sheets are in good demand.

Coke.—Ohio by-product foundry coke has been reestablished at \$7.75 per ton, Painesville, for November shipment. By-product coke for domestic use is moving fairly well, and a general price advance of 50c. a ton is expected Nov. 1. At present egg coke

is quoted at \$5, Cleveland, for outside, and at \$4.50, Valley ovens.

Bolts, Nuts and Rivets.—Bolt and nut makers report a slight improvement in orders. Good specifications are coming from the automotive and farm implement industries and from jobbers. Prices are firm. The demand for rivets is steady, but moderate.

Old Material.—The local market continues quite active and firm, but prices are no higher than a week ago, and there is a slight indication of an easier market tone. For delivery to local mills against outstanding orders, dealers are paying the quoted prices and are getting all the scrap they need. In the Youngstown district, heavy melting steel and compressed sheet scrap are bringing \$16.50 to \$16.75 from dealers. A local dealer was able to buy a small tonnage of heavy melting steel from a Pittsburgh district broker at \$17.50, or the same price that the latter was paying a week ago.

Prices per gross ton delivered consumers' yards:

Basic Open-Hearth Grades		
No. 1 heavy melting steel.....	\$14.00 to	\$14.50
No. 2 heavy melting steel.....	13.25 to	13.50
Compressed sheet steel.....	13.50 to	14.00
Light bundled sheet		
stamp'gs.....	11.50 to	11.75
Drop forge flashings.....	12.25 to	12.75
Machine shop turnings.....	9.25 to	9.75
No. 1 railroad wrought.....	12.75 to	13.00
No. 2 railroad wrought.....	14.50 to	15.00
No. 1 busheling.....	13.00 to	13.25
Pipes and flues.....	9.00 to	9.50
Steel axle turnings.....	12.50 to	13.00
Acid Open-Hearth Grades		
Low phos. forging crops.....	16.00 to	16.50
Low phos., billet, bloom		
and slab crops.....	17.00 to	17.50
Low phos. sheet bar crops.....	16.50 to	17.00
Low phos. plate scrap.....	15.50 to	16.00
Blast Furnace Grades		
Cast iron borings.....	10.50 to	10.75
Mixed bor'gs and short		
turn'gs.....	10.50 to	10.75
No. 2 busheling.....	10.50 to	10.75
Cupola Grades		
No. 1 cast.....	16.50 to	17.00
Railroad grate bars.....	11.00 to	12.00
Stove plate.....	12.00 to	12.50
Rails under 3 ft.....	16.75 to	17.25
Miscellaneous		
Railroad malleable.....	16.00 to	16.50
Rails for rolling.....	16.25 to	16.50

New Electrolytic Zinc Plant at St. Louis

ST. LOUIS, Oct. 20.—Announcement has been made by officials of the Evans-Wallower Lead Co. of plans for the erection in East St. Louis, Ill., of a plant for the production of electrolytic zinc, which, already under construction, will be located adjacent to the plant of the Monsanto Chemical Works and the Cahokia power plant of the St. Louis Union Electric Co., from which the power will come.

The plant has been designed to use low-grade Western concentrates with the recovery of by-products. However, in periods of over-production in the tri-State district, zinc concentrates from Joplin, Mo., will be used. The effect of operation of a plant of this kind, it is said, will be to stabilize the markets for concentrates and metals rather than disturb the balance between output and consumption.

The electrolytic process to be used

is stated to make a higher grade of zinc than any now on the market and, as announced by the Bunker Hill Co., will approximate 99.99 per cent purity. Chief among the uses of the metal will be in the brass and die casting industries. By-products will include cadmium, manganese dioxide used in the manufacture of dry cells, and lead. The new plant of the Evans-Wallower Lead Co. probably will be operated through a subsidiary known as the Evans-Wallower Zinc Co., and will operate on the Tainton process of electrolytic deposition of metal from the roasted zinc concentrates.

A second order for a 17-ton iron ore unloader has been placed by the Bethlehem Steel Co. with the Wellman-Seaver-Morgan Co., Cleveland. This will be a duplicate of an unloader bought a few weeks ago. Both machines will be erected at the Lackawanna plant of the Bethlehem company at Buffalo.

San Francisco

Pipe Line in Oregon Takes 1200 Tons of Plates—Steel Business Mostly in Small Orders

SAN FRANCISCO, Oct. 20 (*By Air Mail*).—Little of importance occurred in the Coast markets for iron and steel products the past week, the majority of both sales and inquiries involving lots of less than 100 tons. The largest award called for 1200 tons of plates for a pipe line at Hood River, Ore., booked by the Steel Tank & Pipe Co.

Pig Iron.—Foundry operations in southern California have improved to some extent, owing to the activity in the Santa Fe Hills oil fields, and demand for pig iron is increasing. However, inquiries and sales have involved small lots.

Prices per gross ton at San Francisco:

*Utah basic	.....	\$25.00 to \$26.00
*Utah fdy., sil.	2.75 to	
3.25	.....	25.00 to 26.00
**Indian fdy., sil.	2.75 to	
3.25	.....	24.00 to 25.00

*Delivered San Francisco.

**Duty paid, f.o.b. cars San Francisco.

Bars.—Only two awards exceeding 100 tons of reinforcing steel bars were reported this week. The larger, 435 tons, for the Balboa High School in San Francisco, went to the Pacific Coast Steel Co. An unnamed interest took 200 tons for an apartment on South Hobart Street, Los Angeles. A fair volume of pending business is being figured. Out-of-stock prices on reinforcing steel bars continue low, and 1.80c., base, is general. On merchant bars the price appears firm at 2.35c., c.i.f.

Plates.—The only sizable plate award of the week went to the Steel Tank & Pipe Co., Portland, Ore., and called for 1200 tons for a pipe line at Hood River, Ore. Bids will be opened next week on 231 tons of 24-in. riveted pipe for Seattle. The Shell Oil Co. has taken no action on its inquiry for 3100 tons for 10 80,000-bbl. tanks for its Dominguez refinery. Prices are unchanged at 2.20c. to 2.25c., c.i.f. Coast ports.

Shapes.—No structural steel awards exceeding 100 tons were reported during the week, and no inquiries of importance developed. The War Department has approved the modified plans and has granted the Southern Pacific a permit to construct a bridge, over a mile long, across the Carquinez Straits at Martinez, Cal. While no

definite estimate of the steel tonnage has yet been given out, the bridge will require about 20,000 tons. Plain material continues firm at 2.35c., c.i.f. On foreign shapes, 1.57c., c.i.f., duty paid, appears to be the lowest quotation.

Cast Iron Pipe.—A slight improvement in demand for cast iron pipe is noticed, but there were few awards during the week. The United States Cast Iron Pipe & Foundry Co. took 1095 tons of 20-in. pipe for a high-

pressure system in Honolulu. Los Angeles opened bids this week on approximately 2000 tons of 6 and 8-in. centrifugal pipe, and Honolulu has taken bids on 700 tons of 12 to 24-in. pipe. Bids will be opened Nov. 5 on 106 tons of 4 to 10-in. Class B pipe for the improvement of Turquoise Street, San Diego, Cal. Bids go in next week on 1284 tons of 24-in. Class B pipe for Seattle; alternate bids are being taken on riveted pipe.

Coke.—Movement of foundry coke has not been heavy. About 4500 tons of English coke is scheduled to arrive on the Coast about the middle of November. English by-product coke is quoted at from \$11.50 to \$13 a net ton, incoming dock, while beehive coke is held at \$16 a net ton.

Boston

Pig Iron Firm—A 50c. Advance Quoted for First Quarter—Scrap Market Strong and Active

BOSTON, Oct. 23.—Strict adherence to quoted prices by Buffalo furnaces has brought a firm pig iron situation in New England. Buffalo interests have been endeavoring to get 50c. a ton additional on iron for first quarter. While little business has been done for that delivery, the quoting of a higher price reflects the strong attitude of Buffalo producers. More than 3000 tons was sold the past week, divided between the Mystic and Buffalo furnaces. Inquiries for more than 1000 tons may be closed soon.

Foundry iron prices per gross ton delivered to most New England points:

*Buffalo, sil.	1.75 to 2.25	.....	\$21.91
*Buffalo, sil.	2.25 to 2.75	.....	\$21.91 to 22.41
†Buffalo, sil.	1.75 to 2.25	.....	20.78
†Buffalo, sil.	2.25 to 2.75	.....	20.78 to 21.28
East. Penn., sil.	1.75 to 2.25	.....	23.65
East. Penn., sil.	2.25 to 2.75	.....	24.15
Va., sil.	1.75 to 2.25	.....	25.71
Va., sil.	2.25 to 2.75	.....	26.21
Ala., sil.	1.75 to 2.25	.....	23.16 to 25.02
Ala., sil.	2.25 to 2.75	.....	23.66 to 25.52

Freight rates: \$4.91 all rail and \$3.78 rail and water from Buffalo; \$3.65 from eastern Pennsylvania; \$5.21 all rail from Virginia, \$6.91 to \$8.77 from Alabama.

*All rail rate. †Rail and water rate.

Reinforcing Bars.—For the Packard Motor Building, 150 tons of bars was placed with the Truscon Steel Co., and Joseph T. Ryerson & Son, Inc., was awarded 180 tons for a mercantile building on Brookline Avenue.

Coke.—Foundries continue to place orders in good volume, showing that pig iron melt is substantial. Local producers expect a good business during the next month or six weeks.

Old Material.—Demand from Pittsburgh mills keeps the local scrap market busy. In addition, there is buying for export. About the last of the month a 5000-ton shipment will leave for Danzig. In view of the fact that Pittsburgh mills have taken so much scrap in the past month, there is a scarcity in some lines. No. 1 heavy melting steel has advanced again, and now is bringing \$11.50 to \$12, f.o.b. cars here, while No. 2 steel strengthened to \$10 to \$10.50. The Worcester mill has bought heavy melting steel at

\$13.50 to \$14, delivered. Turnings have advanced to \$7 to \$7.50.

Buying prices per gross ton, f.o.b. Boston rate shipping points:

No. 1 heavy melting steel	.....	\$11.50 to \$12.00
Scrap T rails	.....	10.00 to 10.50
Scrap girder rails	.....	9.50 to 10.00
No. 1 railroad wrought	.....	10.50 to 11.00
No. 1 yard wrought	.....	8.00 to 8.50
Machine shop turnings	.....	6.25 to 6.75
Cast iron borings (steel works and rolling mill)	.....	6.50 to 7.00
Bundled skeleton, long	.....	8.50 to 9.00
Forge flashings	.....	9.00 to 9.50
Blast furnace borings and turnings	.....	7.00 to 7.50
Forged scrap	.....	6.50 to 7.00
Shafting	.....	14.50 to 15.00
Steel car axles	.....	16.00 to 16.50
Wrought pipe 1 in. in diameter (over 2 ft. long)	.....	9.50 to 10.00
Rails for rolling	.....	10.50 to 11.00
Cast iron borings, chemical	.....	9.50 to 10.00

Prices per gross ton delivered consumers' yards:

Textile cast	.....	\$14.00 to \$14.50
No. 1 machinery cast	.....	15.50 to 16.00
No. 2 machinery cast	.....	13.50 to 14.00
Stove plate	.....	10.50 to 12.50
Railroad malleable	.....	15.00 to 15.50

Warehouse Prices, f.o.b. Boston

	Base per Lb.
Plates	..... 3.365c.
Structural shapes—	
Angles and beams	..... 3.365c.
Tees	..... 3.365c.
Zees	..... 3.465c.
Soft steel bars, small shapes	..... 3.265c.
Flats, hot-rolled	..... 4.15c.
Reinforcing bars	..... 3.265c. to 3.54c.
Iron bars—	
Refined	..... 3.265c.
Best refined	..... 4.60c.
Norway rounds	..... 6.60c.
Norway, squares and flats	..... 7.10c.
Spring steel—	
Open-hearth	..... 5.00c. to 10.00c.
Crucible	..... 12.00c.
Tie steel	..... 4.50c. to 4.75c.
Bands	..... 4.015c. to 5.00c.
Hoop steel	..... 5.50c. to 6.00c.
Cold rolled steel—	
Rounds and hex	..... *3.55c. to 5.55c.
Squares and flats	..... *4.05c. to 7.05c.
Toe calk steel	..... 6.00c.
Rivets, structural or boiler	..... 4.50c.
	Per Cent Off List
Machine bolts	..... 50 and 5
Carriage bolts	..... 50 and 5
Lag screws	..... 50 and 5
Hot-pressed nuts	..... 50 and 5
Cold-punched nuts	..... 50 and 5
Stove bolts	..... 70 and 10

*Including quantity differentials.

Warehouse Prices, f.o.b. San Francisco

	Base per Lb.
Plates and struc. shapes	..... 3.15c.
Soft steel bars	..... 3.15c.
Small angles, $\frac{3}{8}$ -in. and over	..... 3.15c.
Small angles, under $\frac{3}{8}$ -in.	..... 3.55c.
Small channels and tees, $\frac{3}{8}$ -in. to 2 $\frac{1}{2}$ -in.	..... 3.75c.
Spring steel, $\frac{1}{2}$ -in. and thicker	..... 5.00c.
Black sheets (No. 24)	..... 5.00c.
Blue ann'l'd sheets (No. 10)	..... 4.00c.
Galv. sheets (No. 24)	..... 5.40c.
Struc. rivets, $\frac{1}{2}$ -in. and larger	..... 5.65c.
Com. wire nails, base per keg	..... \$3.40
Cement c't'd nails, 100-lb. keg	..... 3.40

St. Louis

Increase in Pig Iron Buying—Some Sales for First Quarter —Scrap Continues to Advance

ST. LOUIS, Oct. 23.—Buying of pig iron took a spurt the past week, the St. Louis Gas & Coke Corporation selling 15,400 tons, more than 3500 of which was for shipment in the first quarter. These were the first sales for next year's delivery. The market is firm, and an advance of 50c. a ton is expected by the local maker, whose shipments for October give promise of being the largest in its history. An important factor in the increasing melt in this district is the stove industry, which is unusually busy. A large part of a lot of 5000 tons of foundry iron bought by a local broker is expected to go to stove manufacturers. Two Belleville stove foundries bought 2500 tons and 500 tons of foundry iron respectively for first quarter, while a third in that center bought 150 tons for prompt delivery. A local stove plant took 500 tons for prompt delivery. St. Louis jobbing foundries took 1700 tons, including a lot of 1200 tons for first quarter. All of the sales were of foundry grades, except 2000 tons of malleable to an Illinois melter for first quarter.

Prices per gross ton at St. Louis:

No. 2 fdy., sil. 1.75 to 2.25, f.o.b.	
Granite City, Ill.	\$19.50 to \$20.00
N'th'n No. 2 fdy., deliv'd St. Louis..	20.16
Southern No. 2 fdy., deliv'd.....	20.67
Northern malleable, deliv'd.....	20.16
Northern basic, deliv'd.....	20.16

Freight rates: 81c. Granite City to St. Louis; \$2.16 from Chicago; \$4.42 from Birmingham.

Coke.—Foundry coke is being consumed in larger quantities, but buying continues on a small scale.

Finished Iron and Steel.—Specifications for plates, shapes and bars continue in fairly large volume. Business in galvanized sheets has slumped considerably, largely because most buyers placed orders before the discount reduction. Structural fabricators report business extremely dull, with no projects of consequence in sight. Reinforcing bar buying is light; the only letting of the week was 300 tons to the Laclede Steel Co. for a warehouse and office building. Warehouse busi-

ness made a good start this month, but fell off somewhat during the last 10 days.

Old Material.—Three of the largest consumers in the St. Louis industrial district came into the market, buying a total of about 15,000 tons of old material for delivery over the next 60 days. The purchases were distributed among a number of dealers, and consisted of heavy melting and shoveling steel, rails and specialties. While dealers' stocks are low, old material is being offered more freely by country dealers. The recent heavy buying gave added strength to the market here, and advances were recorded in heavy melting steel, heavy shoveling steel, miscellaneous standard-section rails, No. 2 railroad wrought, No. 1 railroad wrought, steel angle bars, No. 1 machinery cast and stove plate. The Frazier-Davis Construction Co. will buy 400 tons of 80-lb. relaying rails for use on the approach to the

St. Louis municipal bridge. Railroad lists include: International & Great Northern, 640 tons; Chicago & Alton, 810 carloads; Chicago, Rock Island & Pacific, 161 carloads; Chicago, Milwaukee, St. Paul & Pacific, 43 carloads; and Frisco, 27 carloads.

Dealers' buying prices, per gross ton, f.o.b. St. Louis district:

No. 1 heavy melting or shoveling steel.....	\$13.00 to \$13.50
No. 2 heavy melting or shoveling steel.....	12.00 to 12.50
No. 1 locomotive tires....	14.50 to 15.00
Miscel. stand-sec. rails including frogs, sw'ches and guards, cut apart..	14.00 to 14.50
Railroad springs.....	15.25 to 15.75
Bundled sheets	9.50 to 10.00
No. 2 railroad wrought...	13.00 to 13.50
No. 1 busheling	9.25 to 9.75
Cast iron borings	8.50 to 9.00
Iron rails	13.00 to 13.50
Rails for rolling.....	15.00 to 15.50
Machine shop turnings....	9.00 to 9.50
Steel car axles	18.25 to 18.75
Iron car axles	27.00 to 27.50
Wrot. iron bars and trans.	20.25 to 20.75
No. 1 railroad wrought...	11.50 to 12.00
Steel rails, less than 3 ft..	15.50 to 16.00
Steel angle bars	13.75 to 14.25
Cast iron carwheels.....	13.50 to 14.00
No. 1 machinery cast.....	15.00 to 15.50
Railroad malleable	13.50 to 14.50
No. 1 railroad cast.....	14.00 to 14.50
Stove plate	12.25 to 12.75
Agricult. malleable.....	11.50 to 12.00
Relay. rails, 60 lb. and under	20.50 to 23.50
Relay. rails, 70 lb. and over	26.50 to 29.00

Canada

Pig Iron and Steel Production in Dominion Has Shown Large Gains This Year

TORONTO, ONT., Oct. 23.—The production of iron and steel in Canada continues to increase. September production of pig iron totaled 90,516 tons, which was slightly under the 91,522 tons in August, but was almost double the 52,470 tons produced in September, 1927. Compared with August, September figures showed increases in tonnage of basic and foundry grades, but these were not sufficient to offset the decline in production of malleable iron. Output of basic iron advanced to 57,424 tons from 54,826 tons in August; foundry iron, at 21,292 tons, compares with 15,210 tons in August, and malleable iron dropped from 21,481 tons in August to 11,800 tons in September. For the nine months ended with September, pig iron production totaled 745,473 tons, an increase of 31 per cent over the 570,414 tons reported for the first nine months of 1927, and 46 per cent greater than the output of 496,876 tons produced in the corresponding period of 1926.

Production of ferroalloys in Canada fell off sharply in September to 2008 tons from 2537 tons in August. For the nine months' period, production totaled 33,414 tons, a decline of 28 per cent from the 42,834 tons produced in the corresponding nine months of 1927.

September production of steel ingots and direct steel castings amounted to 99,888 long tons, an increase of 13 per cent over the 88,677 tons produced in the previous month and 84 per cent greater than the 54,250 tons reported for September, 1927.

Output of steel ingots and direct steel castings for the nine months ended with September totaled 919,710 long tons. This tonnage was 36 per cent over the 674,289 tons reported for the corresponding nine months of 1927, which in turn was 12 per cent greater than the 600,542 tons produced in the first three quarters of 1926. This year's output to date included 888,039 tons of steel ingots and 31,671 tons of direct steel castings.

Pig Iron.—A strong demand continues to feature business in this market. Buyers are showing keen interest and are placing orders for small lots, mostly for immediate needs, although some are ordering for late fall and early winter. Spot orders of from 50 to 300 tons were closed during the week, with total sales running about 1200 tons. Prices are holding firm.

Prices per gross ton:

Delivered Toronto	
No. 1 fdy., sil. 2.25 to 2.75.....	\$23.60
No. 2 fdy., sil. 1.75 to 2.25.....	23.60
Malleable	23.60

Delivered Montreal	
No. 1 fdy., sil. 2.25 to 2.75.....	25.00
No. 2 fdy., sil. 1.75 to 2.25.....	25.00
Malleable	25.00
Basic	24.00

Imported Iron, Montreal Warehouse	
Summerlee	33.50
Carron	33.00

Structural Steel.—Structural steel continues in strong demand. Orders in prospect for early closing include: 1200 tons for office building at Ottawa, Ont., for the Sun Life Insurance Co., Montreal; 3500 tons for Dominion Government building on Wellington Street, Ottawa; 300 tons for collegiate

Warehouse Prices, f.o.b. St. Louis

Base per Lb.	
Plates and struc. shapes.....	3.25c.
Bars, soft steel or iron.....	3.15c.
Cold-fin. rounds, shafting, screw stock	3.75c.
Black sheets (No. 24).....	4.10c.
Galv. sheets (No. 24).....	4.95c.
Blue ann'd sheets (No. 10).....	3.45c.
Black corrug. sheets (No. 24).....	4.15c.
Galv. corrug. sheets.....	5.00c.
Structural rivets.....	3.75c.
Boiler rivets	3.75c.

Per Cent Off List	
Tank rivets, $\frac{7}{16}$ -in. and smaller, 100 lb. or more.....	65
Less than 100 lb.....	60
Machine bolts	60
Carriage bolts.....	60
Lag screws	60
Hot-press. nuts, sq., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50
Hot-press. nuts, hex., blank or tapped, 200 lb. or more.....	60
Less than 200 lb.....	50

building at Oshawa, Ont.; 200 tons for factory on Beaudy Street, Montreal, for the Eagle Shoe, Ltd.; 150 tons of structural and 100 tons reinforcing bars for factory building for R. C. Jamieson & Co., 264 St. Patrick Street, Montreal; 1000 tons structural and 350 tons reinforcing bars for bridge at Sherbrooke, Que., for municipal government; 250 tons structural for Y. M. C. A. building at St. Catharines, Ont.; 500 tons reinforcing bars for hospital at Essendale, Victoria, B. C.; 200 tons reinforcing bars for store building for S. W. Randall, 675 Richards Street, Vancouver, B. C.; 200 tons for warehouse for Northern Electric Co., Ltd., 313 Water Street, Vancouver, B. C.; 150 tons for office building for the Coast Investment Corporation, Ltd., 425 Howe Street, Vancouver, B. C.

Old Material.—Transactions in iron and steel scrap continue in good volume in the Toronto and Montreal markets. Sales for the week were well up to the high level for the year, but were almost entirely for spot delivery.

With consumers showing more interest in the market, and winter weather only a short distance away, dealers are giving attention to yard supplies. Buying by the local dealers has increased and some large tonnages are going into yards for winter distribution. Some purchases of large tonnages recently were at 50c. per ton above the general market.

Dealers' buying prices:

	Per Gross Ton	
	Toronto	Montreal
Heavy melting steel.....	\$9.50	\$7.00
Rails, scrap.....	10.00	9.00
No. 1 wrought.....	9.00	11.00
Machine shop turnings..	7.00	5.00
Boiler plate.....	7.00	6.00
Heavy axle turnings.....	7.50	6.50
Cast borings.....	7.50	5.00
Steel turnings.....	7.00	5.50
Wrought pipe.....	5.00	5.00
Steel axles.....	14.00	20.00
Axles, wrought iron.....	16.00	22.00
No. 1 machinery cast.....	16.00	16.00
Stove plate.....	13.00	13.00
Standard carwheels.....	16.00	16.00
Malleable.....	13.00	13.00
	Per Net Ton	
No. 1 machinery cast.....	15.00	.....
Stove plate.....	9.00	.....
Standard carwheels.....	13.00	.....
Malleable scrap.....	13.00	.....

Detroit

Fourth Quarter Automobile Production Will Break All Records—No Major Recession in Sight

DETROIT, Oct. 23.—Prospects for a continuance of the present highly satisfactory conditions in the automotive industry are good. Apparently, fourth quarter earnings and fourth quarter production will break all records. There may be temporary slackening up about the first of 1929, but such a movement should not prove serious.

The employment barometer of the Employers' Association has again turned upward after several weeks of recession. The present total is 293,563, an increase of 553 over the figure reported a week ago. This compares with 195,295, the figure of a year ago. The employment figure for the 51 large plants in Toledo, as of Oct. 5, shows 36,314—a 445 unit increase over the preceding week and an increase of 13,743 over the corresponding week in 1927.

Every assembly plant in the Ford organization is now in operation, and production is running at 5500 units a day, with reasonable assurance that the previous production record on Model T cars will be equaled. Approximately 500,000 cars and trucks have been produced by the Ford plants since the first of the year. It is said that the Ford organization can turn out 10,000 units a day without further additions of equipment. Ford still has about 600,000 unfilled orders on the books. Approximately 125,000 employees are working in the Detroit plants.

The production schedule at Willys-Overland plant is based on an output for the current month of between 22,000 and 25,000 units, which will exceed the September production of

22,000 units. About 1100 cars per day are being turned out by this organization.

The 1927 production of the Marmon Motor Car Co. has already been exceeded in the first nine months of the current year by 4000 units. Total production to Oct. 1 was about 16,000 units.

The Packard Motor Car Co., to Oct. 1, had shipped 37,033 cars, an increase of approximately 53 per cent over the 1927 figure to that date.

The Murray Body Co. has practically completed a program for increasing capacity from 425 bodies a day to approximately 900. All units are operating at capacity.

The Fisher Body Corporation is planning a production of 1,250,000 Chevrolet bodies in its Cleveland plant during the coming year. The plant is now down for inventory.

The Chrysler Corporation of Canada has bought 67 acres between Ford City and Walkerville, Ont., for the erection of a plant to cost approximately \$1,500,000. The present plant in Windsor will be used to turn out parts. Approximately 360 cars per day will be the capacity of the new plant.

The Hayes Body Corporation is preparing for a 1929 schedule of something over \$20,000,000 worth of bodies.

The Motor Wheel Corporation is contemplating an expansion program which will include a new building 220 ft. square for the production of wire wheels. This will bring the wire wheel capacity to 6000 a day. Another building 200 x 400 ft. will be used for hub manufacture.

Birmingham

Steel Orders, Excepting Rails, Keep Mills Busy

BIRMINGHAM, Oct. 23.—Pig iron buying is confined to small lots for early needs. Several of the larger melters are covered for the fourth quarter, but a portion of the iron for this period is yet to be sold. Inquiries are light and involve small tonnages. Shipments are falling a little below production for the first time in several weeks. No change has been made in furnace operations since Oct. 7. Of the 18 in blast, 15 are on foundry, two on basic and one on ferromanganese.

Prices per gross ton, f.o.b. Birmingham dist. furnaces:

No. 2 fdy., 1.75 to 2.25 sil.....	\$16.25
No. 1 fdy., 2.25 to 2.75 sil.....	16.75
Basic.....	16.25

Finished Steel.—The market is characterized by a strong demand and a good run of orders in all lines except steel rails. The rail mill of the Tennessee company has been closed down during the past few weeks owing to lack of business. Rail inquiries the past week were better than in any recent week. Other mill operations are at a high rate. Mills are unable to supply the demand for sheets. Bars, plates and shapes are stronger than at any time in months. Prices are unchanged, and mills are holding closely to quotations. Structural steel fabricators have sufficient business to keep them busy for several weeks. Reinforcing bar orders are coming in well. Open-hearth operations have been the same during the past two weeks; the Tennessee company is operating seven at Fairfield and the Gulf States Steel Co. four at Alabama City. The Tennessee company will place some of its open-hearths at Ensley in operation this week.

Cast Iron Pipe.—Several small orders are being booked, but the total tonnage is light. Plants continue to operate at about the same rate, but unfilled tonnage is less than half that of a month ago. Shipments are fair, and very little pipe has been stocked this month. Quotations are unchanged from \$36 to \$37 on 6-in. and larger sizes.

Coke.—Foundry coke is moving in fair volume. Quotations are unchanged from the \$5 base for both spot and contract coke.

Old Material.—An undertone of strength continues, and demand is better than at any time this year. Prices are unchanged. Pressure for delivery continues strong, and shortages have developed in some lines.

Prices per gross ton, deliv'd Birmingham dist. consumers' yards:

Heavy melting steel.....	\$12.50
Scrap steel rails.....	\$12.00 to 12.50
Short shoveling turnings..	8.00 to 8.50
Cast iron borings.....	8.00
Stove plate.....	13.50
Steel axles.....	19.00 to 20.00
Iron axles.....	21.00 to 22.00
No. 1 railroad wrought...	10.00 to 10.50
Rails for rolling.....	14.00 to 15.00
No. 1 cast.....	15.00
Tramcar wheels.....	13.00 to 14.00
Cast iron carwheels.....	13.00 to 13.50
Cast iron borings, chem...	13.50 to 14.00

Cincinnati

Pig Iron Sales Decline But Prices Are Steady—Steel Specifications Are in Smaller Volume

CINCINNATI, Oct. 23.—Pig iron sales have fallen off the past week, although shipments to consumers on current contracts are in normal volume. The only important sale was 750 tons of Northern foundry iron to a Springfield, Ohio, melter by a Lake Erie producer. Most buyers in this district have contracted for their needs for the remainder of the year, and inquiries for the early part of 1929 are scarce. Prices are firm, with northern Ohio sellers quoting a minimum of \$17.50, base furnace. Southern iron is unchanged at \$16.25, base Birmingham. The only Ironton, Ohio, furnace interest which has iron to offer is asking \$17.50, base furnace.

Prices per gross ton, deliv'd Cincinnati:

So. Ohio fdy., sil. 1.75 to 2.25.....	\$19.39
Ala. fdy., sil. 1.75 to 2.25.....	19.94
Ala. fdy., sil. 2.25 to 2.75.....	20.44
Tenn. fdy., sil. 1.75 to 2.25.....	19.94
S'th'n Ohio silvery 8 per cent.....	26.89

Freight rates, \$1.89 from Ironton and Jackson, Ohio; \$3.69 from Birmingham.

Coke.—The coke market continues active, and users are taking liberal quantities of by-product foundry coke on contracts. Beehive foundry coke from the Wise County and New River districts also is moving at a fairly good rate. By-product foundry coke is steady at \$7 per net ton, f.o.b. ovens, or \$9.14, delivered Cincinnati, and this price is expected to stay in effect through November. The schedule for domestic grades, however, may be advanced 50c. a ton on Nov. 1.

Finished Material.—District sheet mills report that specifications and orders declined slightly the past week, but indications are that the decrease will be more than offset by the substantial volume of incoming business this week. Shipments this month are about paralleling production, and unfilled tonnage assures 100 per cent mill operations for at least two weeks. Demand remains unusually well balanced. The release of specifications by automobile makers getting into production on new models should aid substantially in keeping the market strong. The roofing season in the South has

been fully up to normal, largely because of favorable weather. Prices are well established at 2.75c. to 2.85c., base Pittsburgh, for black, 2c. for blue annealed and 4c. for automobile body sheets. Bars, structural shapes and plates are quoted at 1.95c. to 2c., base Pittsburgh, but bookings in October have been considerably less than in September, when consumers were taking out sizable tonnages on third quarter contracts. In wire goods there has been an improvement in sales. Common wire nails are unchanged at approximately \$2.69 per keg, delivered Cincinnati.

Old Material.—While district steel mills are not anticipating future requirements by making purchases of scrap, prices continue firm, with cast iron grades and rail items advancing 25c. to 50c. a ton on account of a shortage in yard stocks.

Dealers' buying prices per gross ton, f.o.b. cars, Cincinnati:

Heavy melting steel.....	\$13.50 to \$14.00
Scrap rails for melting.....	14.00 to 14.50
Loose sheet clippings.....	9.50 to 10.00
Bundled sheets.....	10.25 to 10.75
Cast iron borings.....	9.75 to 10.25
Machine shop turnings.....	9.25 to 9.75
No. 1 busheling.....	11.00 to 11.50
No. 2 busheling.....	6.50 to 7.00
Rails for rolling.....	14.00 to 14.50
No. 1 locomotive tires.....	13.50 to 14.00
No. 2 railroad wrought.....	13.50 to 14.00
Short rails.....	18.50 to 19.00
Cast iron carwheels.....	12.50 to 13.00
No. 1 machinery cast.....	18.00 to 18.50
No. 1 railroad cast.....	14.25 to 14.75
Burnt cast.....	10.50 to 11.00
Stove plate.....	10.50 to 11.00
Brake shoes.....	10.25 to 10.75
Railroad malleable.....	13.50 to 14.00
Agricultural malleable.....	12.50 to 13.00

Buffalo

Pig Iron Inquiries Include Some for First Quarter—Steel Plants Busy—Scrap Goes Higher

BUFFALO, Oct. 23.—A strong tone is apparent in the pig iron market. Inquiries are more numerous, and the total is about 4500 tons of all grades, with a 1000-ton lot of malleable heading the list. A 900-ton inquiry for foundry iron and two for 500 tons each are also active. A malleable inquiry for 700 tons is accompanied by one for 300 tons of low silicon foundry and 100 tons of high silicon foundry. Several 100 to 200-ton lots are also up for bidding. Among the inquiries are some lots for the first quarter, the first real interest exhibited in that delivery. No pig iron was shipped on the barge canal last week. Prices are holding firm.

Prices per gross ton, f.o.b. furnace:

No. 2 fdy., sil. 1.75 to 2.25.....	\$17.00 to \$18.00
No. 2X fdy., sil. 2.25 to 2.75.....	17.50 to 18.50
No. 1X fdy., sil. 2.75 to 3.25.....	18.50 to 19.50
Malleable, sil. up to 2.25.....	17.50 to 18.50
Basic.....	17.00 to 17.50
Lake Superior charcoal.....	27.28

Old Material.—No. 1 heavy melting steel is now at \$16.75 to \$17, some substantial sales having been made at \$16.75 and smaller sales at \$17. A local dealer is reported to have purchased a tonnage of No. 1 heavy melting steel at Bradford, Pa., for \$15.75, on cars. Four markets now exist here for blast furnace borings and turnings, and several sales are reported at \$12. Stove plate is stronger, a sale having been made to a district foundry

dry at \$15.50. Some sales of knuckles and couplers, rolled steel wheels and short steel rails at \$17.75 have been made. The Pittsburgh district is offering \$18 for No. 1 heavy melting steel. Considerable No. 2 steel is reported as going to Pittsburgh from this district.

Prices per gross ton, f.o.b. Buffalo consumers' plants:

Basic Open-Hearth Grades	
No. 1 heavy melting steel.....	\$15.75 to \$17.00
No. 2 heavy melting steel.....	14.25
Scrap rails.....	15.50 to 16.00
Hydraulic comp. sheets.....	14.25
Hand bundled sheets.....	12.00 to 12.50
Drop forge flashings.....	13.50 to 14.00
No. 1 busheling.....	14.75 to 16.00
Hvy. steel axle turnings.....	13.50 to 14.00
Machine shop turnings.....	7.50 to 8.00
No. 1 railroad wrought.....	14.50 to 15.00
Acid Open-Hearth Grades	
Knuckles and couplers.....	17.50 to 18.00
Coil and leaf springs.....	17.50 to 18.00
Roller steel wheels.....	17.00 to 17.50
Low phos. billet and bloom ends.....	18.00 to 18.50
Electric Furnace Grades	
Short shov. steel turnings.....	12.00 to 12.50
Blast Furnace Grades	
Short shov. steel turnings.....	12.00 to 12.50
Short mixed borings and turnings.....	11.00 to 12.00
Cast iron borings.....	11.00 to 12.00
No. 2 busheling.....	11.00 to 12.00
Rolling Mill Grades	
Steel car axles.....	18.75 to 19.25
Iron axles.....	21.00 to 22.00
Cupola Grades	
No. 1 machinery cast.....	16.00 to 16.50
Stove plate.....	14.50 to 15.00
Locomotive grate bars.....	13.00 to 13.50
Steel rails, 3 ft. and under.....	17.50 to 18.00
Cast iron carwheels.....	13.00 to 13.50
Malleable Grades	
Industrial.....	16.00 to 16.50
Railroad.....	16.00 to 16.50
Agricultural.....	16.00 to 16.50

Finished Iron and Steel.—Specifications are holding up well and considerable new business is coming out in all lines. The bar and shape price is being maintained at 2.05c. to 2.10c., Buffalo, and sheet prices are firm at 2.75c. for black; 4c. for automobile

Warehouse Prices, f.o.b. Cincinnati

Base per Lb.

Plates and struc. shapes.....	3.40c.
Bars, soft steel or iron.....	3.30c.
New billet reinf. bars.....	3.15c.
Rail steel reinf. bars.....	3.00c.
Hoops.....	4.00c. to 4.25c.
Bands.....	3.95c.
Cold-fin. rounds and hex.....	3.85c.
Squares.....	4.35c.
Black sheets (No. 24).....	3.90c.
Galvanized sheets (No. 24).....	4.75c.
Blue ann'l'd sheets (No. 10).....	3.45c.
Structural rivets.....	3.85c.
Small rivets.....	.65 per cent off list
No. 9 ann'l'd wire, per 100 lb.....	\$3.00
Com. wire nails, base per keg.....	2.95
Cement o'd nails, base 100 lb. keg.....	2.95
Chain, per 100 lb.....	7.55
Net per 100 Ft.	
Lap-weld. steel boiler tubes, 2-in.....	\$18.00
4-in.....	38.00
Seamless steel boiler tubes, 2-in.....	19.00
4-in.....	39.00

Warehouse Prices, f.o.b. Buffalo

Base per Lb.

Plates and struc. shapes.....	3.40c.
Soft steel bars.....	3.30c.
Reinforcing bars.....	2.75c.
Cold-fin. flats, sq. and hex.....	4.45c.
Rounds.....	3.95c.
Cold rolled strip steel.....	5.85c.
Black sheets (No. 24).....	4.20c.
Galv. sheets (No. 24).....	4.85c.
Blue ann'l'd sheets (No. 10).....	3.50c.
Com. wire nails, base per keg.....	\$3.60
Black wire, base per 100 lb.....	3.75

body and 3.50c. to 3.60c. for galvanized. Automobile body sheet business is still holding at capacity of the local mill. A 250-ton State building at Napanoch, N. Y., went to the Kellogg Structural Steel Co.; also several miscellaneous jobs of less than 100 tons of fabricated steel have been

awarded. Bolt and nut business is exceptionally good, though jobbers' orders are lighter. The Donner Steel Co. is operating eight of its nine open-hearth; Bethlehem's Lackawanna plant, 23 out of 24 open-hearth; Seneca Iron & Steel Co., 95 per cent, and Buffalo Bolt Co., 75 per cent.

Railroad Equipment

Chicago, Rock Island & Pacific Inquires for 2750 Cars— Pennsylvania to Build 1000 Box Cars

WITH the Chicago, Rock Island & Pacific inquiring for 2750 freight cars, the Canadian National asking for bids on 1500 cars in addition to its previous wants and the Buffalo, Rochester & Pittsburgh soon expected to enter the market for 1000 box cars, the railroad equipment market is showing the most activity in several months. Outstanding orders during the week were given to company shops, the Pennsylvania having placed 1000 box cars and the Chicago, Indianapolis & Louisville, 100 of a similar type.

Chicago, Rock Island & Pacific has inquired for 1000 50-ton steel underframe, single-sheathed box, 500 40-ton stock, 1000 gondola and 250 flat cars. Road is soon expected to enter market for 250 ballast cars.

Canadian National is inquiring for 1000 automobile and 500 40-ton refrigerator cars. This is in addition to its recent inquiry for 1500 box, 300 flat and 30 tank cars.

Buffalo, Rochester & Pittsburgh is expected to enter market for 1000 box cars and 25 locomotives.

New York Central is asking for bids on rebuilding for 50 70-ft. steel underframe coaches.

Chicago, Burlington & Quincy will build 20 all steel suburban coaches, one dynamometer car and 11 trailers at its Aurora, Ill., shops.

Pennsylvania Railroad will build 1000 steel box cars at its Altoona, Pa., shops.

Chicago, Indianapolis & Louisville will build 100 box cars in its own shops.

Chicago & North Western is inquiring for 100 caboose cars.

Canadian Pacific is building 25 caboose cars in its own shops.

Lazote, Inc., Wilmington, Del., has ordered 25 tank cars from General American Tank Car Corporation.

Barrett Co. has ordered six tank cars from General American Tank Car Corporation.

Pennsylvania Railroad, through its associated company, Transcontinental Air Transport, Inc., has ordered 10 trimotored monoplanes for combined rail and air service between Atlantic and Pacific coasts from Ford Motor Co.

Cleveland Union Terminals Co. has ordered unstated number of electric locomotives from General Electric Co.

Manufacturers Railway, St. Louis, will purchase two eight-wheel switching locomotives.

cent report a shortage of skilled workers and 2 per cent note an unsatisfied demand for unskilled labor. In 1927 8 per cent reported a shortage of skilled workers, and 2 per cent, of unskilled labor. Wage increases since last fall are reported by 77.4 per cent, of whom 4.5 per cent note large increases and 72.9 small, while among those reporting decreases 22.4 per cent note small reductions. In 1927 27 per cent reported large and small decreases. Increased production over the previous year is reported by 65 per cent, compared with 50 per cent so reporting last year; greater sales quantities are reported by the same percentage of replies, compared with 49 per cent noting increased sales volume in 1927, and higher sales values are noted by 52 per cent, as against 38 per cent so reporting in 1927.

Reinforcing Steel

Railroad Warehouse Will Take 8500 Tons

ADDITION of 5500 tons to the previous requirements for a railroad terminal warehouse at Jersey City brought the total of new projects reported during the last week to 6700 tons. The following awards of 4100 tons include none of outstanding size:

BROOKLYN, 300 tons, subway section 5, route 107 under Schermerhorn Street; from Necaro Co., Inc., general contractor, to Concrete Steel Co.

BROOKLYN, 500 tons, building for Brooklyn Ash Removal Co., Inc., to Truscon Steel Co.

CRANFORD, N. J., 330 tons, grade separation work for Central Railroad of New Jersey, to Joseph T. Ryerson & Son, Inc.

CHICAGO, 275 tons of rail steel bars, apartment building at Seventy-third Street and South Shore Drive, to Inland Steel Co.

CHICAGO, 600 tons of rail steel bars, negro housing project, to an unnamed bidder.

CHICAGO, 500 tons of rail steel bars, Hodgson Building, to Inland Steel Co.

CHICAGO, 100 tons of rail steel bars, garage on Madison Street, to an unnamed bidder.

CHICAGO, 700 tons, Powhatan Hotel, to American System of Reinforcing.

ST. LOUIS, 200 tons, office building and warehouse for N. O. Nelson Mfg. Co., to Laclede Steel Co.

LOS ANGELES, 200 tons, apartment building on South Hobart Street, to unnamed interest.

SAN FRANCISCO, 435 tons, Balboa School, to Pacific Coast Steel Co.

Reinforcing Bars Pending

Inquiries for reinforcing steel bars include the following:

AMENIA, N. Y., 660 tons, power plant development; M. Kantrawitz, Albany, N. Y., general contractor.

JERSEY CITY, 8500 tons, terminal warehouse for Delaware, Lackawanna & Western Railroad Co.; previously reported as 3000 tons.

CINCINNATI, 300 tons, building for Union Gas & Electric Co.

AKRON, OHIO, 200 tons, Wiener Building.

CHICAGO, tonnage not stated, Nurses' Home, for Cook County Hospital.

CHICAGO, 200 tons, apartment building; R. DeGoyler, architect.

ST. LOUIS, 200 tons, Deaconess Hospital.

Clayton and Oakland Avenues.

Survey Finds Business Improved

Reports from 4000 Manufacturers Indicate Prosperous Conditions with 94 Per Cent Reporting Favorable Outlook

PRESENT business, immediate trade prospects, inventories, employment conditions, demand for labor, the wage scale paid and the degree of industrial peace enjoyed by industry all show an improvement over last year, according to a survey by the National Association of Manufacturers made public at the organization's annual convention, which was held Oct. 22 to 24 in New York. Based upon replies to a questionnaire received from about 4000 companies since Oct. 1, the survey presents a current picture.

A summary of the survey shows that present trade is reported as favorable by 93 per cent of those reporting, of whom 17.3 per cent pronounce it excellent, 41.4 per cent good, 34.5 per cent fair and 6.8 per cent poor. In 1927 the percentage of favorable returns was 91 per cent. Even better are the expectations for winter trade, 94 per cent of the replies viewing prospects as favorable. Excellent prospects are reported by 14.3 per cent, good by 43 per cent and fair by

36.7 per cent. Only 6 per cent of the reporting companies regard the outlook as poor. In 1927, 92 per cent reported a favorable outlook. Better business than last fall is reported by 50.7 per cent, with 24.1 per cent noting it unchanged, and 25.2 per cent reporting it not so good as in 1927. Last year 33 per cent reported an improvement in business, with 40 per cent reporting a falling off as compared with the year before. Depleted inventories are reported by 16.3 per cent, normal stocks by 74.2 per cent, and an oversupply of goods on hand by 9.5 per cent. Last year 11 per cent reported their inventories overstocked.

Increased employment over last fall is reported by 67.9 per cent, of whom 14.5 per cent report large increases and 53.4 small gains. Of those reporting a decrease, 3 per cent recorded a large falling off, and 29.1 per cent a small decrease. Last year 57 per cent reported large and small decreases.

Although the supply of all classes of labor appears to be normal, 13 per

Non-Ferrous Metal Markets

Copper Active With Prices Advanced, Tin Quiet But Stronger, Lead and Zinc Unchanged

Copper.—Another advance of $\frac{1}{4}$ c. per lb. has been made and the market is very strong. The increases were preceded by quite heavy sales last week and it is estimated that domestic orders totaled about 25,000 tons, with foreign sales about 20,000 tons. The domestic price for electrolytic copper was advanced on Monday, preceded by some sales on Saturday, to 15.50c., delivered in the Connecticut Valley. On Monday, all producers were quoting this price and reporting sales. On Tuesday, the official price of Copper

THE WEEK'S PRICES. CENTS PER POUND FOR EARLY DELIVERY

	Oct. 23	Oct. 22	Oct. 20	Oct. 19	Oct. 18	Oct. 17
Lake copper, New York.....	15.62½	15.62½	15.37½	15.37½	15.37½	15.37½
Electrolytic copper, N. Y.*.....	15.25	15.25	15.00	15.00	15.00	15.00
Straits tin, spot, N. Y.	48.75	49.50	.....	49.62½	48.95	48.87½
Lead, New York.....	6.50	6.50	6.50	6.50	6.50	6.50
Lead, St. Louis.....	6.32½	6.32½	6.32½	6.32½	6.32½	6.32½
Zinc, New York.....	6.60	6.60	6.60	6.60	6.60	6.60
Zinc, St. Louis.....	6.25	6.25	6.25	6.25	6.25	6.25

*Refinery quotation; delivered price $\frac{1}{4}$ c. higher.

Exporters Inc., was advanced to 15.75c., c.i.f. European ports. Producers report active demand from all sources and some sellers have willingly made sales into January. Most of the buying is for December-January shipments, with foreign consumers also purchasing October-November. Domestic consumers are virtually covered to the end of the year. Lake copper is active and higher at 15.50c. to 15.62½c., delivered.

Tin.—In the week ended Saturday, Oct. 20, sales were light at about 800 tons. Dealers took the major portion, consumers buying little. It is evident that the latter are well covered for the rest of the year. Arrivals, which have totaled 5930 tons this month, are heavy and stocks are ample both here

and in London. There is also 6610 tons afloat and there are no signs of a famine. The market here Tuesday was quiet, with spot Straits tin quoted at 48.75c., New York. London prices Tuesday were as follows: Spot standard, £222 5s.; future standard, £220 2s. 6d., and spot Straits, £222 10s. The Singapore price was £224 2s. 6d. The feature of these quotations is the fact that the premium of spot Straits over spot standard is only 5s., whereas a month ago it was £2 10s. per ton.

Lead.—This market has been quite active and strong in the last few days, with prices unchanged at 6.32½c., St. Louis, and 6.50c., New York, the latter being the contract price of the leading interest. Buying has been participated in by all the leading con-

Metals from New York Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	50.50c. to 51.50c.
Tin, bars	52.50c. to 53.50c.
Copper, Lake	16.50c.
Copper, electrolytic.....	16.25c.
Copper, casting	15.50c.
Zinc, slab	7.25c. to 7.75c.
Lead, American pig.....	7.50c. to 8.00c.
Lead, bar	9.25c. to 10.25c.
Antimony, Asiatic	13.00c. to 13.50c.
Aluminum No. 1 ingots for remelting (guar'nt'd over 99% pure)	25.00c. to 26.00c.
Alum. ingots, No. 12 alloy.....	24.00c. to 25.00c.
Babbitt metal, commerc'l grade.....	30.00c. to 40.00c.
Solder, $\frac{1}{2}$ and $\frac{1}{4}$	32.50c. to 33.50c.

Metals from Cleveland Warehouse

Delivered Prices Per Lb.

Tin, Straits pig.....	54.50c.
Tin, bar	56.50c.
Copper, Lake	16.00c.
Copper, electrolytic.....	16.00c.
Copper, casting	15.75c.
Zinc, slab	8.00c.
Lead, American pig	7.00c. to 7.25c.
Lead, bar	9.50c.
Antimony, Asiatic	16.00c.
Babbitt metal, medium grade.....	18.75c.
Babbitt metal, high grade.....	59.00c.
Solder, $\frac{1}{2}$ and $\frac{1}{4}$	33.00c.

Rolled Metals from New York or Cleveland Warehouse

Delivered Prices, Base Per Lb.

Sheets—	
High brass.....	20.00c.
Copper, hot rolled.....	24.75c.
Copper, cold rolled, 14 oz. and heavier	26.50c.
Seamless Tubes—	
Brass	24.87½c.
Copper	25.75c.
Brazed Brass Tubes.....	28.00c.
Brass Rods.....	17.75c.

From New York Warehouse

Delivered Prices, Base Per Lb.

Zinc sheets (No. 9), casks	10.00c. to 10.50c.
Zinc sheets, open.....	11.00c. to 11.50c.

Non-Ferrous Rolled Products

Mill prices on brass and copper products were advanced $\frac{1}{4}$ c. on Oct. 22, the first change since Sept. 24. Zinc sheets have been quoted at 9.75c., base, since July 30, and lead full sheets at 10c. to 10.25c. since May 29.

List Prices, Per Lb., f.o.b. Mill

On Copper and Brass Products. Freight up to 75c. per 100 Lb. Allowed on Shipments of 500 Lb. or Over

Sheets—	
High brass.....	20.00c.
Copper, hot rolled.....	24.25c.
Zinc	9.75c.
Lead (full sheets).....	10.00c. to 10.25c.
Seamless Tubes—	
High brass.....	24.87½c.
Copper	25.75c.

Rods—

High brass	17.75c.
Naval brass	20.50c.

Wire—

Copper	17.50c.
High brass	20.50c.
Copper in Rolls.....	23.25c.
Brazed Brass Tubing.....	28.00c.

Aluminum Products in Ton Lots

The carload freight rate is allowed to destinations east of Mississippi River and also to St. Louis on shipments to points west of that river.

Sheets, 0 to 10 gage, 3 to 30 in. wide	33.00c.
Tubes, base	42.00c.
Machine rods.....	34.00c.

Old Metals, Per Lb., New York

Buying prices represent what large dealers are paying for miscellaneous lots from smaller accumulators and selling prices are those charged customers after the metal has been properly prepared for their uses.

	Dealers' Buying Prices	Dealers' Selling Prices
Copper, hvy. crucible.....	13.25c.	14.50c.
Copper, hvy. and wire	12.75c.	13.75c.
Copper, light and bottoms	11.25c.	12.375c.
Brass, heavy.....	7.50c.	8.50c.
Brass, light	6.25c.	7.25c.
Hvy. machine composition	10.00c.	11.25c.
No. 1 yel. brass turnings	9.25c.	9.75c.
No. 1 red brass or compos. turnings... ..	9.25c.	10.25c.
Lead, heavy.....	5.25c.	5.625c.
Lead, tea	3.75c.	4.25c.
Zinc	3.25c.	3.625c.
Sheet aluminum	12.50c.	14.50c.
Cast aluminum	11.75c.	13.50c.

Rolled Metals, f.o.b. Chicago Warehouse

(Prices Cover Trucking to Consumers' Doors in City Limits)

Sheets—	Base per Lb.
High brass	20.00c.
Copper, hot rolled.....	24.25c.
Copper, cold rolled, 14 oz. and heavier	26.50c.
Zinc	10.00c.
Lead, wide	9.75c.
Seamless Tubes—	
Brass	26.37½c.
Copper	27.25c.
Brass Rods.....	17.75c.
Brazed Brass Tubes.....	28.00c.

sumers. On some days a little metal has been available at 6.30c., St. Louis.

Zinc.—Activity is not pronounced, but moderate sales are reported by producers each day. Quotations are unchanged at 6.25c., East St. Louis, or 6.60c., New York, although it is stated that on one or two occasions the metal has changed hands at 6.22½c., East St. Louis. The ore situation is virtually unchanged both as to price and output. The quotation is still \$40, Joplin, and the production last week was about 10,800 tons. Shipments were a little over 10,500 tons so that stocks were practically unchanged at about 56,800 tons.

Antimony.—Prices for Chinese metal are lower due to larger stocks in China and less demand here. Quotations on Tuesday were 10.50c. for spot and 10.25c. for futures, duty paid, New York.

Nickel.—Ingot nickel in wholesale

lots is quoted at 35c., shot nickel at 36c. and electrolytic nickel at 37c. per lb.

Aluminum.—Virgin metal, 98 to 99 per cent pure, is quoted at 23.90c. per lb., delivered.

Non-Ferrous Metals at Chicago

CHICAGO, Oct. 23.—Shipments are steady but new sales are light. Prices for lead are higher. The old metal market is quiet in sales though shipments are in good volume.

Prices, per lb., in carload lots: Lake copper, 15.50c.; tin, 49.50c.; lead, 6.45c.; zinc, 6.35c. in less-than-carload lots; antimony, 12.25c. On old metals we quote copper wire, crucible shapes and copper clips, 10.75c.; copper bottoms, 9.75c.; red brass, 9.50c.; yellow brass, 7.25c.; lead pipe, 4.75c.; zinc, 3.50c.; pewter, No. 1, 30c.; tin foil, 36.25c.; block tin, 45.25c.; aluminum, 12c., all being dealers' prices for less-than-carload lots.

Fabricated Structural Steel

Awards of 25,500 Tons Include 6000 Tons for New York Subway—21,000 Tons in New Projects

AWARDS declined considerably from the average of recent weeks, amounting to only 25,500 tons. Included were 6000 tons for New York subway work and 4000 tons of plates for an oil company in the West. New projects, totaling 21,000 tons, included 4000 tons for railroad grade crossing work at Manayunk, Pa., 3000 tons for Cleveland Union Terminals Co. bridges and 3000 tons in buildings for a copper company at El Paso, Tex. Awards follow:

STATE OF MASSACHUSETTS, 275 tons, highway bridges, to Boston Bridge Works, Inc.
NEW YORK, 6000 tons, subway section 3, route 106, to Harris Structural Steel Co.
NEW YORK, 1200 tons, George Washington Hotel at Lexington Avenue and Twenty-third Street, to A. E. Norton, Inc.
NEW YORK, 400 tons, apartment building at Fifty-eighth Street and First Avenue, to McClintic-Marshall Co.
NEW YORK, 1100 tons, building on East Nineteenth Street for Sisters of the Sacred Heart, to Hinkle Steel Construction Co.
BROOKLYN, 400 tons, apartment building at 57 Pierpont Street, to Lehigh Structural Steel Co.
NAPANCOCH, N. Y., 250 tons, staff and cell building, to Kellogg Structural Steel Co.
ROCHESTER, N. Y., 600 tons, grandstand, to Genesee Bridge Co.
PHILADELPHIA, 130 tons, foundation for electrification of Norristown branch of Philadelphia Electric Co., to Belmont Iron Works.
PHILADELPHIA, 100 tons, mill building for Cramp-Morris Co., to Belmont Iron Works.
PITTSBURGH, 630 tons, four river barges for Pittsburgh Plate Glass Co., to Midland Barge Co.
WILKES-BARRE, PA., 730 tons, building for Bell Telephone Co., to Shoemaker Bridge Co.
NEW CASTLE, PA., 400 tons, North Street bridge, to Independent Bridge Co.
VIRGINIAN RAILWAY, 400 tons, bridge, to Virginia Bridge & Iron Co.
SOUTHERN RAILWAY, 600 tons, bridge in Kentucky, to American Bridge Co.
STATE OF KENTUCKY, 1650 tons, Pope's Lick viaduct, to American Bridge Co.
SYLACAUGA, ALA., 220 tons, addition to

Avondale Mills, to Ingalls Iron Works.
SANFORD, FLA., 110 tons, fruit packing plant, to Ingalls Iron Works.
ALABASTER, MICH., 600 tons, building for United States Gypsum Co., to American Bridge Co.
DETROIT, 800 tons, building for Chrysler Corporation, to Russell Wheelan Foundry Co.
CHILLICOTHE, OHIO, 1100 tons, paper mill, to McClintic-Marshall Co.
PHILO, OHIO, 300 tons, gallery for power house, to Dauchy Iron Works, Chicago.
RACINE, WIS., 100 tons, building for Walker Mfg. Co., to Midland Structural Steel Co., Chicago.
ROCK ISLAND, ILL., 1600 tons, building for International Harvester Co., to McClintic-Marshall Co. and Gage Structural Steel Co.
BLOOMINGTON, ILL., 385 tons, office building, to Mississippi Valley Structural Steel Co.
CHICAGO, 100 tons, building for Midland Terra Cotta Co., to Midland Structural Steel Co., local.
EAST ST. LOUIS, ILL., 100 tons, Parks Airport, to St. Louis Structural Steel Co.
KANSAS CITY, MO., 4000 tons of plates, tanks for Roxana Petroleum Corporation, to United Iron Works.
HOOD RIVER, ORE., 1200 tons plates, pipe line, to Steel Tank & Pipe Co.

Structural Projects Pending

Inquiries for fabricated steel work include the following:

NEW YORK, 800 tons, public schools 92 and 96.
ORANGEBURG, N. Y., 1000 tons, Rockland State Hospital buildings.
EASTON, PA., 500 tons, building for Lafayette College.

PHILADELPHIA, 2700 tons, building for Atwater-Kent Mfg. Co.
PHILADELPHIA, 500 tons, General Hospital at Thirty-fourth and Pine Streets.
NORRISTOWN, PA., 500 tons, addition to Montgomery County Court House.
MEDIA, PA., unnamed tonnage, Delaware County Court House.
DOVER, N. J., 700 tons, buildings at Picatinny Arsenal.
READING RAILROAD, 4000 tons, grade crossing eliminations at Manayunk, Pa.; call for bids not yet issued.
CLEVELAND, 3000 tons, catenary bridges for Cleveland Union Terminals Co.
CLEVELAND, 500 tons, bridge for Nickel Plate Railroad.
ELMHURST, ILL., 190 tons, school; Midland Structural Steel Co., Chicago, low bidder.
DULUTH, MINN., 2000 tons, lift bridge; American Bridge Co., low bidder.
EL PASO, TEX., 3000 tons, buildings for Nichols Copper Co.
KANSAS CITY, MO., 450 tons, Kline Building.
PARADISE, MONT., 600 tons, highway bridge across Columbia River.
SACRAMENTO, CAL., 206 tons, highway work in San Diego County; bids Nov. 7.
LOS ANGELES, 120 tons, hospital on Glendale Boulevard; bids being taken.
LOS ANGELES, 250 tons, apartment building on South Wilton Place; bids being taken.

Scrap Institute Discusses Classifications

Modification of the present specifications on scrap for freight rate purposes was discussed at a meeting of the classification committee of the Institute of Scrap Iron and Steel in New York, Oct. 18. It was suggested that such a modification would permit shipments of material under a scrap classification, even when it is not intended for remelting. Certain tests to be applied to the classification of scrap were proposed by Murray N. Billings of the Illinois Steel Co.

Alloy steel scrap specifications were considered at a meeting of the specifications committee of the institute on Oct. 17. The committee agreed to study the uniform specifications drawn by the United States Department of Commerce and discuss them at the next meeting of the committee to be held in Philadelphia.

Sheet & Tube to Add New Bar Capacity

The Youngstown Sheet & Tube Co. will install a 10-in. bar mill and a 14-18-in. bar mill with a monthly capacity of 30,000 tons, at its Indiana Harbor works, and will make additions to the open-hearth furnace capacity at that works sufficient to supply the extra requirements of these new mills. The latter are to be of the Morgan continuous type. Expansion of the open-hearth furnace department is to include an increase in the soaking pit capacity. Work is to be started immediately on these changes.

The National Enameling & Stamping Co., Inc., has moved its offices at Milwaukee to 12 Twelfth Street, that city.

PERSONAL

L. N. HOPKINS, since 1905 purchasing agent for the Chicago, Burlington & Quincy Railroad Co. and associated with the company for 43 years, retired on Sept. 1. He has been succeeded by JOSEPH R. HAYNES, who has been assistant purchasing agent for 23 years.

JOHN MCARTLE, recently identified with the Chrysler Corporation, Detroit, has been elected vice-president and general manager and a director of the Jordan Motor Car Co., Cleveland. E. S. JORDAN has been reelected president of the company, and A. F. ENGLAND, secretary, treasurer and a director.

SAMUEL P. GILBERT has resigned as purchasing agent for the Sharon, Pa., plant of the Westinghouse Electric & Mfg. Co. to become president of the Rogers Paper Mfg. Co., South Manchester, Conn.

RALPH K. FORD, formerly of the Ford Coal & Coke Co., is now identified with the Buffalo office of Rogers Brown & Crocker Brothers, Inc.

JOHN WANAMAKER has been appointed purchasing agent for the Apollo Steel Co., Apollo, Pa., succeeding GEORGE T. MCCARTHY.

CHARLES RANDOLPH, who has been buyer for the forge plant of the Chevrolet Motor Car Co., Detroit, has resigned to enter business on his own account as a distributor of pneumatic lathe grinders and supplies.

J. NEWTON SMITH, for a number of years vice-president and treasurer of the Boston Woven Hose & Rubber Co., Boston, has been elected president of that company, succeeding the late GEORGE E. HALL. He will also continue as treasurer. ARTHUR C. KINGSTON, director of sales, has been elected a vice-president.

BOYD B. JACK, formerly vice-president and general manager of the Empire Steel Co., Cleveland, has been appointed assistant to the president of the West Penn Steel Co., Brackenridge, Pa.

WALTER F. MUNNIKHUYSEN has been appointed district engineer for the Koppers Construction Co., Pittsburgh, with offices at 823 Peoples Gas Building, Chicago.

H. PARKER, purchasing agent for the Rome Wire Co., Rome, N. Y., has been placed in charge of that company's new plant at Mobile, Ala. He has been succeeded at Rome by STANLEY O. WILLIAMS.

LOUIS A. HAWTHORNE has been appointed development engineer for the

Atlas Fence Co., 25 Verona Avenue, Newark, N. J. He was formerly associated with the Carnegie Steel Co. and with the General Electric Co. in a similar capacity and has had wide experience in the fence industry.

S. W. PERRY, formerly representative of the DeVilbiss Co., Toledo, Ohio, with headquarters at Monmouth, Ill., has joined the sales organization of the Alexander Milburn Co., Baltimore, and will represent the company in its Middle Western territory.

M. C. RHODES, recently in the engineering department of the Riley Stoker Corporation, Worcester, Mass., has been appointed manager of the mechanical department of the Standard Power Equipment Corporation, St. Louis.

F. C. BIGGERT has relinquished the presidency of the United Engineering & Foundry Co., Pittsburgh, and George T. Ladd, vice-chairman Com-



F. C. BIGGERT

bustion Engineering Corporation, has been elected to succeed him. Mr. Biggert had expressed a desire to be relieved of the business management of the company, as he believed that his value to it would be materially increased if his entire time could be devoted to matters of engineering and research. He remains with the company as vice-president and senior engineer. Mr. Ladd, following early association with the rolling mill and roll business, founded, and for many years headed, the George T. Ladd Boiler Co., acquired by the International Combustion Engineering Corporation a few years ago. Mr. Ladd, in going with this organization, became president of the Ladd Water Tube Boiler Co. and the Heine Boiler Co., another subsidiary of the International Corporation.

LESLIE WHEELER, treasurer. Pickands, Brown & Co., Chicago, has returned from a four months' visit in Europe.

S. C. BLOOM and CHARLES F. KAMRATH have established a consulting and architectural engineering business with offices in the Monadnock Block, 330 South Dearborn Street, Chicago.

D. A. CRAWFORD, president Pullman Car & Mfg. Corporation, Chicago, has been elected executive vice-president of the Pullman Co.

F. B. COYLE, metallurgist International Nickel Co., New York, addressed a joint dinner meeting of the Quad-City Foundrymen's Association and the American Society for Steel Treating at the LeClaire Hotel, Moline, Ill., on Oct. 15.

A. W. VAN BUREN, formerly Chicago sales manager for the Consolidated Machine Tool Corporation of America, has joined the sales organization of the E. L. Essley Machinery Co., 551 West Washington Boulevard, Chicago.

HANS P. DAHLSTRAND, chief engineer steam turbine department, Allis-Chalmers Mfg. Co., has been elected president of the Engineers' Society of Milwaukee. WILLIAM E. CRAWFORD, electrical engineer A. O. Smith Corporation, has been named vice-president; H. W. RHODE, secretary, and WALTER R. MUELLER, treasurer. New directors include JOSEPH B. ARMITAGE, chief mechanical engineer Kearney & Trecker Corporation, and C. T. EVANS, electrical engineer Cutler-Hammer Mfg. Co.

DR. W. H. HATFIELD, Sheffield, England, addressed the Washington chapter of the American Society for Steel Treating on Oct. 3. His remarks were related largely to the Campbell Memorial lecture which he delivered before the American Society for Steel Treating at the annual convention in Philadelphia.

A. SERTON of The Hague, Netherlands, is now in the United States seeking a connection to sell in Europe steel specialties of American manufacture, such as alloy steels. For some years he formerly had residence in this country and represented in Europe the one-time Consolidated Steel Corporation. His temporary quarters are at 508 West 112th Street, New York.

GEORGE E. BALDWIN, formerly New York special sales representative Poldi Steel Corporation, has been appointed district sales manager for Braeburn Alloy Steel Corporation, Braeburn, Pa., in the metropolitan district of New York, including the State of Connecticut, with office at 55 West Forty-second Street, New York.

VERNON W. WELLS, Carborundum Co., Niagara Falls, N. Y., was the

principal speaker at October meeting of the Fort Wayne chapter of the American Society for Steel Treating. He talked on the manufacture of grinding wheels and on carborundum for furnace linings and other purposes. NORMAN L. DENBLE, Central Alloy Steel Corporation, Massillon, Ohio, will speak at a meeting of the chapter Nov. 21.

P. J. GORDON, for many years superintendent at Youngstown for the Republic Iron & Steel Co., has been appointed assistant to W. M. NECKERMAN, general manager.

Obituary

ERNEST L. DILDINE, founder of the Dildine Bridge & Iron Works Co., Hannibal, Mo., died Oct. 16. He was born at Summerville, South Norwich, Canada, in 1858 and for 20 years was in business at Cameron, Mo. He established the Dildine company at Hannibal 17 years ago.

FRED M. PRESCOTT, president Prescott Co., Menominee, Mich., manufacturer of oil pumps, saw mill machinery, etc., died Oct. 17, after a brief illness. He was 67 years of age. He was born in Denver, Colo., and was graduated from Cornell University in 1885. After conducting a hardware and mining supply business at Ironwood, Mich., he went to Milwaukee in 1904 and founded the Fred M. Prescott Steam Pump Co. Upon the purchase of the business by the International Steam Pump Co. in 1912, Mr. Prescott moved to Menominee to take charge of the Prescott Co., founded in 1867 by his father, the late D. Clinton Prescott, and expanded its saw mill machinery business to embrace electrically and steam driven pumping units. Two sons, Curry and Fred, Jr., are associated with the enterprise. Mr. Prescott was a member of the board of control of the Michigan College of Mines and Technology, Houghton, of the Lake Superior Mining Institute, the Engineers Club of New York, and the Hydraulic Club of New York.

LEON FALK, a director of the Weirton Steel Co. and the Edgewater Steel Co. and vice-president of the Federated Metals Co., died at Rochester, Minn., Oct. 20. He was born in Pittsburgh 58 years ago, and had spent the greater part of his life in that city. He was one of the founders of the Duquesne Reduction Co. and the Crown Chemical Co., now subsidiaries of the Federated Metals Co.

FRANK GIFFORD DREW, chairman of the board of the Winchester Repeating Arms Co., New Haven, Conn., died on Oct. 19, following an automobile accident at Pine Beach, N. J., which occurred as he was returning from the convention of the National

Hardware Association at Atlantic City. He was born at Philadelphia in 1872 and became associated with the Winchester organization in 1903. He served in the sales department for a number of years and in 1916 became head of that department. He was elected president in 1924 and two months ago, wishing to be relieved of

the more strenuous executive duties of the company, he was made chairman of the board. He was also vice-president of the Winchester-Simmons Co. and of the Simmons Hardware Co. During the war he was a member of the advisory board of the Bridgeport Ordnance District, United States War Department.

Steel Industry Presents Good Record

Chairman Taylor of Steel Corporation's Finance Committee Addresses Conference on Industries

ECONOMIC improvement in production of iron and steel came in for attention by Myron C. Taylor, chairman of the finance committee United States Steel Corporation, in an address Oct. 24 at a Conference of Major Industries at Columbia University, New York. His paper covered the progress of the industry in America and its position in the world today, the investment and profit return and a word in general on the future.

Speaking of the efforts to reduce costs, he gave the following general averages based on total tonnage and total employees of a sufficient number of plants to make them typical of the industry:

Annual Output of Finished Steel Products per Employee Engaged in the Manufacture of Iron and Steel

In 1902.....	65.45 tons
1927.....	80.91 tons
Increase	15.46 tons
Per cent of increase..	23.62%

"While this increased productivity of labor," said he, "can be attributed principally to installation of labor-saving machinery, equipment and facilities, substitution of larger and modern type units of production for many small and obsolete plants abandoned, and to improvements in operating methods, it also is due in considerable part to the progressive attitude of American workmen, who more and more have realized the vital relationship existing between volume and quality of production and higher wages.

"Present average earnings of iron and steel workers in the United States, according to a recent report published by the National Industrial Conference Board, is 12 per cent higher than the average hourly rate paid by all of the industries covered in the report mentioned, and is more than 50 per cent higher than the average labor rate paid by a number of the industries included."

Early in the address Mr. Taylor massed some figures to visualize the magnitude of the business in all its branches and ramifications. "One might say that to produce and convert each year into its multitude of finished forms our 1926 output of 48,000,000 tons of raw or ingot and casting steel requires the handling of about 200,000,000 tons of raw materials and the employment of 1,000,000 workers, receiving upward of \$1,400,000,000," he said. "The total value of

the manufactured products of the industry safely may be stated to be at least \$3,000,000,000, while the business turnover represented by sales of products moving through their several stages to the ultimate consumer reaches the large total of about \$7,000,000,000."

Profit Return Steadily Downward

In the matter of profit returns, he said in part: "From published reports of the leading corporations in the trade, it has been estimated that the capital put into the industry as original investment plus net profits retained, is upward of \$4,750,000,000, and that if valuations of tangible properties owned and used be rated at current-day cost of reproduction, less accrued deterioration on that basis, the total would be at least \$6,000,000,000.

"If profit return were to be calculated with reference to present values based on reproduction and reacquirement cost, the return would be probably somewhere around 4 per cent. The trend of profit return on investment for the past quarter century, eliminating the war period, has been steadily downward. In the case of the leading interest in the industry the annual average for the five years 1902 to 1906 was 6.67 per cent."

Fabricated Structural Steel Orders Continue Heavy

WASHINGTON, Oct. 23.—Orders for fabricated structural steel reported to the Department of Commerce in September totaled 243,942 tons, or 84 per cent of the monthly capacity of 292,015 tons of the 201 reporting firms. They compare with 285,508 tons, or 95 per cent of a capacity of 301,070 tons of 214 reporting firms in August, a record month. Computed bookings in September were 315,000 tons, against 356,250 tons in August, while computed shipments were 277,500 tons and 296,250 tons respectively, being 74 and 79 per cent of capacity.

For the nine months ended with September computed bookings were 2,553,750 tons, compared with 2,276,000 tons for the corresponding period of last year. Computed shipments have been below bookings: 2,283,750 tons in nine months this year and 2,156,250 tons last year.

Machinery Markets and News of the Works

Prospects Continue Good

Machine Tool Buying Expected to Hold Up to
End of Year at Least

MACHINE tool orders in the past week have lagged slightly behind the average of preceding weeks, but the amount of buying still in prospect leaves little doubt that business over the remainder of the year will continue at a fairly high rate. Some reports are that the total of October orders may equal that of September.

One of the large orders was for 42 special welding machines, totaling about \$300,000, placed by a Western company with the Niles-Bement-Pond Co.

The automobile industry continues one of the largest buyers. The Rolls Royce Co. of America, Springfield, Mass., is inquiring for about 30 machines. The aviation industry has become a more promising source of business. The E. W. Bliss Co., Brooklyn, has bought some machines and will

require, in all, about 50 for production of the Bliss Jupiter airplane engine.

Machine tool companies are bidding on the large list of the Norfolk & Western Railroad. The Chicago, Milwaukee, St. Paul & Pacific is about to place orders against a recent list. The New York Central has placed a few miscellaneous orders.

R. Hoe & Co., New York, printing press manufacturers, will soon place orders for six planers and prices have been asked for on about 20 lathes.

Some machine tool plants have sufficient orders to maintain current production schedules to the end of the year. Deliveries on a few types of tools range from eight to 10 weeks, although on the general run of equipment the range is nearer four to six weeks.

New York

NEW YORK, Oct. 23.—Orders for machine tools so far this month indicate that the total may be less than that of September. While some sellers report a slight falling off in business, others see no marked change. Business in prospect is large. The E. W. Bliss Co., Brooklyn, is buying equipment for the manufacture of Bliss Jupiter airplane engines, and its total requirements are said to be about 50 tools. The Rolls Royce Co. of America, Springfield, Mass., is getting prices on about 30 tools. R. Hoe & Co., New York, printing press manufacturers, will soon place orders for six planers and are getting bids on about 20 lathes. The New York Central placed a number of orders in the week, and the General Electric Co., Schenectady, was also a buyer. The Niles-Bement-Pond Co. booked an order for 42 special welding machines, totaling about \$300,000, from a Western company.

Other orders reported by Niles-Bement-Pond Co. are: One 36 in. x 14 ft. Time-Saver lathe, two No. 108 Ransom grinders, Cincinnati high-speed tapping ma-

chine, Cincinnati high-speed bench tapping machine, Aurora 20-in. drill, two Brown & Sharpe universal grinders, Niles-Acme 24-in. heavy-duty shaper, three Ransom 12-in. grinders, Acme 2-in. bolt cutter and Long & Alstatter I-beam punch. Pratt & Whitney division sold three No. 1 deep-hole drilling machines, five jig borers, 20 x 120-in. lathe, universal die sinker, 4½ x 12-in. thread miller.

Gotham Can Co., 225 Broadway, New York, is having plans drawn for a three-story plant at Brooklyn, to cost about \$40,000 with equipment. James McKillop, 821 Manhattan Avenue, Brooklyn, is architect.

Utah Copper Co., 25 Broad Street, New York, has plans for a new copper leaching plant near Bingham, Utah, to cost more than \$250,000 with equipment.

Procurement District, Signal Corps, Brooklyn, will receive bids until Nov. 6 for 3500 batteries, 2500 terminal wing-nuts, 2500 half-hinges, 25,000 machine screws, and other electrical equipment, circular 28.

Nash Queens Motor Corporation, 9430 Merrick Boulevard, Jamaica, L. I., will soon take bids for a three-story service, repair and garage building, to cost about \$230,000 with equipment. Brutus Gund-

lach, 110 East Forty-second Street, New York, is architect.

DeYoung & Moscovitz, 11 East Forty-fourth Street, New York, architects, have plans for a two-story addition to automobile service, repair and garage building, 100 x 125 ft., including improvements in present building, to cost about \$115,000 with equipment.

Fairchild Aviation Corporation, 270 West Thirty-eighth Street, New York, has arranged for increase in capital of Fairchild Aviation, Ltd., a Canadian subsidiary, to more than \$500,000, and plans early construction of new plant near Lac a la Tortue, Que., to manufacture airplanes and seaplanes, including parts production and assembling, for small aircraft and multi-motored transports. Initial works are reported to cost more than \$250,000. Company has recently discontinued working agreement with Vickers, Ltd., Montreal, for manufacture of Fairchild airplanes in Canada. Sherman M. Fairchild is president.

Ovens, power equipment, conveying and other machinery will be installed in three-story addition to plant of Pioneer Baking Co., 120 Getty Avenue, Paterson, N. J., to cost \$100,000. A. W. Lang, 1904 Madison Avenue, is architect.

Jersey Central Power & Light Co., 20 South Street, Asbury Park, N. J., is said to be planning construction of new steam-operated electric power plant at South Amboy, N. J., to cost more than \$450,000 with equipment.

New Jersey Bell Telephone Co., 1050 Broad Street, Newark, has plans for a two-story automobile service, repair and garage building for company motor trucks and cars, to cost about \$130,000 with equipment. Voorhees, Gmelin & Walker, 101 Park Avenue, New York, are architects.

Board of Education, Oradell, N. J., is said to be planning installation of manual training equipment in new three-story junior high school, for which superstructure will soon begin, to cost \$385,000. Coffin & Coffin, 522 Fifth Avenue, New York, are architects.

C. Mundt & Sons, 53 Fairmount Avenue, Jersey City, N. J., manufacturers of perforated metals, have awarded general contract to Peter Redfern & Sons Co., 569 Jackson Avenue, for a one and one-half story machine shop. John T. Rowland, Jr., 30 Journal Square, is architect.

Northern New Jersey Oil Co., 395-407 Riverside Avenue, Newark, has acquired adjoining property for expansion in storage and distributing plant.

Board of Education, Newark, has taken title to property occupied by Newark Academy as site for new building for Fawcett School of Industrial Arts, now at 55 Academy Street, to cost more than \$200,000. Newark Academy will remove to new building on First Street.

Chromium Engineering Corporation, 246 Fifth Avenue, New York, will soon open chromium plating plant with facilities for all kinds of chromium plating. Corporation has previously been engaged only in

The Crane Market

MUCH of the present activity in overhead traveling cranes is in the Middle West. In the New York and New England districts, inquiries for single cranes continue to accumulate, but prospective buyers are slow to place business. Sellers of locomotive cranes and steam shovels report a moderate volume of

inquiry, largely from contractors. In New York, Patrick McGovern, Inc., contractor on a water tunnel from Yonkers, N. Y., to Brooklyn, is reported to have bought a large number of steam shovels from an Ohio builder. D. C. Serber, Inc., New York, contractor, is understood to have bought two 5-ton truck cranes.

Among recent purchases are: Union Carbon & Carbide Co., New York, 10-ton, 56-ft. span electric crane for Duluth, Minn., from Whiting Corporation.

New York Central Railroad, New York, 25-ton, standard gage locomotive crane, from unnamed builder.

supervision and installation of chromium plating plants for manufacturers and job shops and new plant is designed for convenience of manufacturers who do not have sufficient work to warrant operating individual plant.

Atlas Steam Pressing Iron Corporation, 282-286 South Street, Newark, N. J., has been formed to manufacture steam pressing irons. Company is in production and is in market for brass couplings and fittings and metal steam hose.

South Atlantic

BALTIMORE, Oct. 22.—American Tin Co., 70 South Franklinton Road, Baltimore, recently formed by William M. Connor and associates, is reported arranging for early operation of local plant.

Club Aluminum Co., 1238 Fullerton Avenue, Chicago, manufacturer of cooking utensils, will discontinue operations at 3500 East Biddle Street, Baltimore, and will remove to Chicago where production will be concentrated in future. Chicago plant will be enlarged with addition, totaling about 30,000 sq. ft. of floor space, to cost more than \$75,000. William A. Burnette is president.

American Oil Co., American Building, Baltimore, has revised plans for a one-story storage and distributing plant at Philadelphia, to cost about \$35,000 with equipment. T. J. O'Connell is company engineer.

Tidewater Transportation Co., care of Moses G. Nusbaum, 1208 West Armistead Bridge Road, Norfolk, Va., recently formed by Mr. Nusbaum and associates, plans new two-story motor bus service, repair and terminal at Brooke Avenue and Boush Street, to cost \$350,000 with equipment. Philip B. Moser & Co., Law Building, are architects.

Town Council, Pulaski, Va., has authorized plans for municipal airport on 60-acre tract, to include hangar, repair and reconditioning shops, oil storage and distributing building and other units.

Supply section, office of chief of engineers, Munitions Building, Washington, will receive bids until Nov. 7 for two 75-kw. motor-generator sets, a.c. and d.c., respectively, two automatic starting compensators, two substation switchboards, three transformers, and four switchboard panels, circular 2.

Fred H. Merritt, Duluth, Minn., and associates are negotiating with Chesterfield Land & Coal Co., Chesterfield, Va., for purchase of about 8000 acres of coal lands between Chesterfield and Wintropock and plan development. Project will include an electric power plant, by-products coal works, machine shop and other units.

Board of Education, Griffin, Ga., will take bids before close of month for new vocational school for colored students. William J. Chase, 140 Peachtree Street, Atlanta, Ga., is architect.

Broad River Power Co., Columbia, S. C., has begun construction of a new unit at steam-operated electric power plant at Parr Shoals to increase capacity to 72,500 kw., to cost more than \$1,000,000 with transmission lines. Company is operated by General Gas & Electric Co., 50 Pine Street, New York.

Board of Awards, Baltimore, Charles F. Goob, chief engineer, has filed plans for one and two-story storage and freight terminal at McComas Street terminal, 100 x 160 ft., including mechanical handling equipment, to cost \$950,000. J. E. Greiner Co., Lexington Building, is engineer.

Board of Commissioners, Star, N. C., T. J. Ellis, commissioner, in charge, is planning purchase of electrically-operated pumping equipment, motor-driven air compressor and accessories, for municipal water system.

Pittsburgh

PITTSBURGH, Oct. 22.—Aluminum Co. of America, Inc., Oliver Building, Pittsburgh, is arranging an expansion program at New Kensington plant to cost over \$1,000,000 with equipment.

Board of Education, Washington, Pa., plans installation of manual training equipment in new high school to cost \$850,000. E. B. Lee, Seventh and Smithfield Streets, Pittsburgh, is architect; C. L. Woolridge, Fulton Building, Pittsburgh, is consulting engineer.

Westinghouse Electric & Mfg. Co., East Pittsburgh, has acquired 12 acres on William Penn Highway, near Wilkinsburg, Pa., as site for new radio experimental station, to include steel towers, power house, mechanical shops and other structures. Dr. Frank Conrad is in charge of radio division of company.

Pillsbury Flour Mills Co., Minneapolis, Minn., is said to be planning new plant at Wellsburg, W. Va., including elevating, screening and other equipment, to cost about \$165,000.

United States Engineer Office, Huntington, W. Va., will receive bids until Oct. 30, for one electrically-operated deep well pumping unit, with accessories, and storage tank, circular 70.

Russell, Burdall & Ward Co., Port Chester, N. Y., has awarded general contract to Austin Co., Pittsburgh, for one-story addition to plant at Coraopolis, Pa., 55 x 100 ft., to cost close to \$50,000 with equipment.

Board of Education, Scottsdale, Pa., is said to be planning installation of manual training equipment in two-story addition to high school to cost \$145,000, for which plans are being completed by W. C. Eckles Co., Lawrence Savings & Trust Building, New Castle, Pa., architect.

Adamston Flat Glass Co., Clarksburg, W. Va., manufacturer of sheet glass

products, is said to be planning an expansion program, including construction of new glass-making unit, to cost over \$600,000 with machinery. New interests recently have become identified with company.

New England

BOSTON, Oct. 22.—Board of Trustees, Massachusetts Institute of Technology, Cambridge, Mass., has awarded general contract to Chase & Gilbert, 250 Stuart Street, Boston, for a one-story engine testing laboratory, 65 x 150 ft., to cost more than \$70,000 with equipment. Coolidge & Carlson, 89 State Street, Boston, are architects.

Bristol Co., Waterbury, Conn., manufacturer of temperature recording instruments, parts, etc., has filed plans for one-story addition to plant at Platts Mills, 48 x 140 ft., to cost over \$40,000 with equipment. It is said that another unit will be built soon.

Boston Ice Co., 110 State Street, Boston, is considering rebuilding of part of plant at Sharon, Mass., destroyed by fire Oct. 13.

Moth Aircraft Corporation, Graybar Building, New York, recently organized to take over license to manufacture in United States D. H. Moth aircraft of deHavilland Aircraft Co., Ltd., London, England, is said to be concluding arrangements for lease of about one half of plant of Rauch & Lang, Inc., Willimansett, Mass., manufacturer of automobiles, and 28 acres adjoining for testing and landing field. It is planned to begin production in November for assembling of aircraft, exclusive of motors, which will be secured from deHavilland company. Initial output will be on basis of 300 planes per annum. Company has arranged for stock issue to total \$690,000, portion of fund to be used for new plant. Minton M. Warren is president.

American Fork & Hoe Co., Keith Building, Cleveland, has awarded general contract to J. M. Swan & Sons, St. Johnsbury, Vt., for one and two-story addition to St. Johnsbury plant, to cost about \$50,000 with equipment.

Abrasive Machine Tool Co., Dexter Road, East Providence, R. I., has awarded general contract to Hunes Construction Co., Central Falls, R. I., for a one-story machine shop, 60 x 150 ft., to cost about \$28,000 with equipment.

Courtland Grinding Wheel Co., Huntington Road, Chester, Mass., has awarded general contract to A. M. Cowles, 5 Crown Street, Westfield, Mass., for two-story addition to cost about \$35,000 with equipment.

Prairie Window Ventilator Co., Georgia Avenue, Providence, R. I., is arranging for installation of enameling equipment in unit recently completed to double present capacity. C. I. Bigney is general manager.

Plant and equipment of Washburn

Chair Co., Warren, Mass., will be sold at public auction on Oct. 25. Sale will include wood-working and other machinery, lumber, merchandise and real estate.

Philadelphia

PHILADELPHIA, Oct. 22.—Bids are being asked on general contract until Oct. 29 by Atwater Kent Mfg. Co., Philadelphia, for one-story addition, 515 x 900 ft., to cost over \$900,000 with machinery. Ballinger Co., Twelfth and Chestnut Streets, is architect and engineer.

Stern & Co., 712 Market Street, Philadelphia, furniture, have leased a new multi-story building to be erected at Sixth Street and Glenwood Avenue, for new storage and distributing unit, with mechanical and woodworking shop, finishing department, etc., to cost over \$600,000 with equipment. LeRoy B. Rothschild, 215 South Broad Street, is architect.

Philip S. Tyre, 114 South Fifteenth Street, Philadelphia, architect, has plans for new two-story automobile service, repair and garage building, to cost approximately \$175,000 with equipment.

Cramp-Morris Industrials, Inc., Richmond and Norris Streets, Philadelphia, manufacturer of turbine engines and other heavy machinery, has awarded general contract to Fred A. Havens Co., 845 North Nineteenth Street, for one-story pipe shop, 58 x 200 ft.

South Jersey Port District, Camden, N. J., is disposing of bond issue of \$2,000,000, proceeds to be used for construction of marine terminal on Delaware River, in cooperation with City Council, to include warehouses with mechanical handling equipment. Project will cost about \$4,000,000.

American Ice Co., City Center Building, Philadelphia, has plans for a one-story plant at Ocean City, N. J., to cost over \$50,000 with equipment. C. Leslie Weir, 41 East Forty-second Street, New York, is engineer.

Pennsylvania Tool & Mfg. Co., 6 West Gay Street, York, Pa., has awarded general contract to Carson Linbaugh, 544 West King Street, for an addition to cost about \$25,000 with equipment.

Following recent reference to proposed manufacture of aircraft engines at plant of F. Wesel Mfg. Co., Scranton, Pa., manufacturer of machinery for printing, photoengraving, etc., a company has been formed under name of General Airmotors Co., with capital of \$30,000, which will make application for State charter on Oct. 25. It is headed by Louis A. Watres, president of Scranton Chamber of Commerce, and Robert B. McClave, vice-president and general manager McClave-Brooks Co., Scranton, manufacturer of grates, castings, etc. It was erroneously stated that Wesel plant had been secured under lease for this manufacture; new company has contracted with Wesel company for production of initial units of five-cylinder, 100-hp. type. Robert S. Moore, designer of engine, will supervise manufacture. Paul W. Gardner, general manager Wesel company, is a director of new organization.

Crane Co., 1301 Locust Street, Philadelphia, with headquarters at Chicago, is completing plans for one-story factory branch and distributing plant at Norristown, Pa., to cost about \$40,000 with equipment. E. Lane Crawford, 509 Swede Street, Norristown, is architect.

McCaffrey File Co., Philadelphia, has been formed with capital of \$100,000 to take over and expand company of same

name with plant at Fifth and Berks Streets. New organization is headed by George B. and John H. Whitwell.

Keystone Aircraft Corporation, Bristol, Pa., has been merged with Loening Aeronautical Engineering Co., 420 East Thirty-first Street, New York, and will increase facilities to manufacture large planes of transport type, in addition to military aircraft.

Cleveland

CLEVELAND, Oct. 22.—While sales are holding up fairly well the market was not quite so active the past week as during the previous week or two. A slowing down in orders is reported in the Michigan territory where automobile companies have been buying considerable equipment for making new models. Business in this territory is still coming in for the most part from automobile parts manufacturers.

White Motor Co. has not yet started to buy equipment it will need for bringing out a new truck model. Its requirements will include drilling and horizontal boring machines. There is an increase in the number of new companies entering the metal-working field in Cleveland which should stimulate the local market.

Smith-Armstrong Forge, Inc., incorporated with a capital stock of \$150,000, will establish a plant at 1209 Marquette Road, Cleveland, to manufacture flat die hammered forgings. Its owners are E. A. Smith and E. Armstrong, for 14 years connected with Machinery Forging Co., Cleveland.

Goodyear Tire & Rubber Co., Akron, Ohio, will establish a tire manufacturing unit in the South to take advantage of favorable production costs and distribution economies. Location has not yet been announced.

Air-Way Electric Appliance Corporation, Toledo, Ohio, manufacturer of domestic electric equipment, is disposing of stock issue of \$6,000,000, part of fund to be used for expansion in production.

Ovens, power equipment, conveying and other machinery will be installed in new three-story plant to be erected by Miami Bread Co., 2256 Robinwood Avenue, Toledo, Ohio, to cost more than \$100,000. Mills, Rhines, Bellman & Nordhoff, Ohio Building, are architects.

Patterson Welding & Repair Co., East Liverpool, Ohio, lately formed by R. L. Cawood, head of Patterson Foundry & Machine Co., has taken over former works of last noted company on South Broadway for new plant. Operation will begin in November. Mr. Cawood will be president and John S. Scott, secretary and treasurer.

Superior Body Co., Lima, Ohio, manufacturer of automobile bodies, has awarded general contract to H. U. Tuttle, Lima, for one-story addition, 60 x 200 ft., to cost about \$32,000 with equipment.

Eaton Axle & Spring Co., East 140th Street, Cleveland, has awarded general contract to Crowell & Little Construction Co., Hanna Building, for one-story addition, 330 x 400 ft., to cost more than \$400,000 with machinery.

Alliance Aircraft Corporation, Alliance, Ohio, will build new one-story plant for parts production and assembling, 60 x 275 ft., to cost about \$50,000 with equipment.

Plant, foundry, machinery and equipment of Carroll Foundry & Machine Co.,

and Bucyrus Road Roller Co., Bucyrus, Ohio, will be sold at public auction on Oct. 30 by Industrial Plants Corporation, 25 Church Street, New York, auctioneer. Sale will include machine tools, foundry and electrical equipment.

Gulf States

BIRMINGHAM, Oct. 22.—Bids will soon be asked on revised plans by Long & Lewis Hardware Co., 2014 Second Avenue, Bessemer, Ala., for one-story storage and distributing plant, 150 x 300 ft., at Birmingham, to cost \$85,000 with equipment. H. J. Skinner, 2208 Dartmouth Avenue, Bessemer, is architect.

City Council, Austin, Tex., is said to be arranging fund of \$1,250,000 for extensions and improvements in municipal lighting plant and waterworks, with installation of additional equipment.

Missouri-Kansas-Texas Railway Co., Dallas, Tex., has awarded general contract to T. H. Johnson, Citizens' National Bank Building, Sedalia, Mo., for new terminal facilities at Smithville, Tex., including engine house, machine shop, wheel shop, etc., to cost over \$150,000 with equipment.

Automatic machinery, conveying, packing and other mechanical equipment will be installed in new two-story plant, 110 x 120 ft., to be built by Houston Coca-Cola Bottling Co., 1210 Washington Street, Houston, Tex., to cost close to \$90,000 with equipment. Pringle & Smith, Norris Building, Atlanta, Ga., are architects. Alfred C. Finn, Bankers' Mortgage Building, Houston, is associate architect.

Shreveport Oil & Refining Co., Shreveport, La., recently formed of Shreveport, Jefferson, and St. Bernard oil companies, is planning new refinery and distributing plant on 10-acre tract on Mississippi River, near New Orleans, reported to cost more than \$650,000 with machinery.

Common Council, Laredo, Tex., is having plans drawn for municipal airport on 380-acre tract recently acquired, to include hangar, machine shop, reconditioning works and other units. Jack Beretta, San Antonio, Tex., is architect.

Board of Education, Brady, Tex., is said to be planning installation of manual training equipment in new high school to cost \$135,000, for which plans are being drawn by Henry T. Phelps, Hicks Building, San Antonio, Tex., architect.

Firestone Tire & Rubber Co., Akron, Ohio, is completing plans for new factory branch and distributing plant at Tampa, Fla., to cost about \$100,000 with equipment. F. J. Kennard & Son, 303 Zack Street, Tampa, are architects.

Tri-Tex Utilities Co., Gunter Building, San Antonio, Tex., has plans for natural gas pipe line in northern part of Zavalla County, and portions of La Salle and Frio Counties, totaling close to 200 miles, to cost over \$1,000,000 with compressor stations and auxiliary equipment.

Texas Co., Houston, Tex., has acquired about 100 acres near El Paso, Tex., and is reported considering new oil refinery to cost more than \$500,000.

City Council, Waco, Tex., plans installation of power equipment, pumping and other machinery for extensions in municipal waterworks, to cost about \$2,000,000. Floyd & Lockridge, Wilson Building, Dallas, Tex., are engineers.

Mississippi Power Co., Gulfport, Miss., has authorized extensions and improvements, including construction of 110,000-volt power transmission line in north-

western part of State, including sub-station and distributing facilities, to cost more than \$90,000.

Claude Neon Federal Co., 2038 Line Street, Shreveport, La., J. O. McFaddin, president, plans new factory to manufacture electric signs and displays.

Buffalo

BUFFALO, Oct. 22.—Augert Auto Parts Co., 652 Broadway, Buffalo, has plans for a new two-story plant unit to cost about \$25,000. L. P. Hoffman, 52 Rose Street, is architect.

Rochester Central Power Co., Rochester, N. Y., has acquired properties of Preston Power Corporation and Lake Ontario Power Corporation, operating at Sodus, Webster, Ontario, Williamson and vicinity, and will consolidate. Expansion will be carried out in district noted, including transmission line construction.

Bernard C. Maler, 1946 East Main Street, Rochester, and associates have organized Rochester Marine Co., with capital of \$25,000, and plan establishment of local plant to manufacture marine engines, including parts and assembling. Emmett J. Cassidy, Charlotte Station, Rochester, is interested in company.

Bendix Corporation, South Bend, Ind., manufacturer of four-wheel automobile brakes, has acquired a controlling interest in Eclipse Machine Co., Elmira, N. Y., heretofore held by General Motors Corporation, and will exercise active management in future. Acquired company specializes in production of automobile starting equipment, airplane equipment and machine parts, and operates plants at Elmira, East Orange, N. J., and Walkerville, Ont. These plants will be continued as in past, and expansion program will be arranged. Electric Auto Lite Co., Toledo, Ohio, has also acquired an interest in Eclipse organization. John W. Ferguson is president of reorganized company.

Stewart Bronze & Aluminum Foundry, Inc., Buffalo, care of Alfred R. Mock, 629 Linden Avenue, recently organized by Mr. Mock and associates, plans early operation of foundry for production of brass, bronze, aluminum and other castings.

Stewart Motor Corporation, 93 Dewey Avenue, Buffalo, manufacturer of motor trucks, has filed plans for a one-story addition to cost about \$30,000.

St. Louis

ST. LOUIS, Oct. 22.—Plans have been filed by N. O. Nelson Mfg. Co., 928 Chestnut Street, St. Louis, manufacturer of plumbing equipment and supplies, for two-story unit, 150 x 257 ft., to cost about \$250,000 with equipment. Preston J. Bradshaw, 718 Locust Street, is architect.

American Eagle Aircraft Corporation, 2330 Harrison Street, Kansas City, Mo., plans new plant at Fairfax airport, Kansas City, Kan., to manufacture airplanes, including parts production and assembling, to cost more than \$200,000 with equipment. E. E. Porterfield, Jr., is president.

Ovens, power equipment, conveying and other machinery will be installed in new baking plant, 100 x 145 ft., at Hot Springs, Ark., by Robert H. Kittelberger, 424 Ouachita Street, to cost about \$100,000, for which contract has been let to J. D. Johnson, 233 Central Avenue.

Wirt-Franklin Oil Co., Ardmore, Okla.,

is said to be planning construction of new oil refinery near Oklahoma City, Okla., to cost more than \$225,000 including machinery.

Curtis Mfg. Co., Keinlen Avenue, St. Louis, manufacturer of pneumatic machinery, including air hoists, air compressors, cranes, etc., has arranged for sale of stock in amount of \$2,220,000, a portion of fund to be used for expansion.

Robertson Aircraft Corporation, St. Louis, Frank H. Robertson, president, has plans for hangar, 100 x 120 ft., machine and mechanical shop, 70 x 120 ft., and other units at Lambert airport, Anglum, near St. Louis. McDonald-Condle, Inc., 502 North Taylor Street, is architect.

Kentucky Cement Corporation, care of Hunt Engineering Co., New York Life Building, Kansas City, Mo., engineer, recently formed with capital of \$2,500,000 by F. B. Drew, McAlester, Okla., and associates, is having plans drawn for new mill near Frankfort, Ky., to cost more than \$2,000,000 with machinery. Project will include boiler plant, machine shop and other units. Leigh Hunt of engineering company noted, is in charge of equipment purchases.

Cudahy Packing Co., 111 West Monroe Street, Chicago, is said to be planning addition to plant at Kansas City, Mo., including conveying and other mechanical handling equipment, to cost over \$150,000.

Greenlease-Moore Cadillac Co., 1201 South Main Street, Tulsa, Okla., has taken bids on general contract for four-story service, repair and sales building, 100 x 140 ft., to cost about \$130,000 with equipment. Noble B. Fleming, Commercial Building, is architect.

Chicago

CHICAGO, Oct. 22.—Reports vary as to the condition of the machine tool market. It is generally agreed however, that inquiry is well sustained, but analysis of new sales gives rise to speculation as to how October will compare with recent months. Much incomplete business is before the trade and the bulk of current sales comes from diversified sources.

International Harvester Co. has closed on most of the list for its Rock Island plant. Tractor manufacturers continue to buy miscellaneous items and it is reported that several large lists may develop from this source. Nash Motors Co. is figuring on further equipment for its Milwaukee plant. Studebaker Corporation, South Bend, Ind., has closed for several tools and a forging plant in Chicago has ordered three large machine tools. A 16-in. shaper has been purchased by a local screw machine parts manufacturer. The railroads are quiet except for action now being taken on Chicago, Milwaukee, St. Paul & Pacific list.

Aetna Ball Bearing Mfg. Co., 737 High Street, Chicago, has purchased 80,000 sq. ft. of property, improved with one-story brick building.

Dallas Brass & Copper Co., 820 New Orleans Street, Chicago, has purchased property in West Grand Avenue district, adjoining present plant, served by Chicago, Milwaukee, St. Paul & Pacific Railway.

American Ironing Machine Co., Algonquin, Ill., has been reorganized with E. C. Peter, president; M. J. Broderick, vice-president and general superintendent; W.

T. Peter, treasurer, and B. C. Getzelman, secretary.

Caspers Tin Plate Co., 1438 West Thirty-seventh Street, Chicago, has awarded general contract to Poirot Construction Co., 38 South Dearborn Street, for one-story unit to cost about \$100,000 with equipment. A. Epstein, 2001 West Pershing Road, is architect and engineer.

Carleton Screw Products Co., 121 Twenty-seventh Avenue, S. E., Minneapolis, Minn., has leased a one-story building, 40 x 150 ft., to be built at Hiawatha Avenue and Twenty-fourth Street, for new plant.

Board of Education, Main Township, Park Ridge, Ill., contemplates installation of manual training equipment in three-story high school between Park Ridge and Des Plaines to cost about \$500,000, for which bids will soon be asked on general contract. Zook & McCaughey, 222 West Adams Street, Chicago, and J. D. Chubb, 109 North Dearborn Street, are associated architects.

Banner Brass Foundry, 1807 Washington Street, Cedar Falls, Iowa, C. W. Olsen, head, is considering new one-story foundry, 40 x 100 ft., to cost about \$24,000 with equipment.

City Council, Durango, Colo., plans installation of power equipment, pumping and other machinery for extensions and improvements in municipal waterworks, to cost \$350,000. A. L. Kroeger is city engineer.

Chrysler-Illinois Co., 3900 South Michigan Avenue, Chicago, representative for Chrysler automobile, is considering new one-story storage, service and repair building, to cost about \$100,000.

Altorfer Brothers Co., East Peoria, Ill., manufacturer of washing machines, will soon begin erection of an addition, 100 x 600 ft., which will increase its floor space nearly 30 per cent.

Rockford Die & Tool Co., 727 Seventh Street, Rockford, Ill., has construction under way on a new factory to cost \$10,000.

Cincinnati

CINCINNATI, Oct. 22.—Machine tool bookings continue to parallel those of September and indications are that unless there is an unexpected slump in orders the coming week, October will take a place beside the two previous months from the standpoint of sales. A good portion of the tools purchased in the past two weeks have come from diversified sources. However, the automobile industry has been by far the biggest buyer and upon sustained demand from that field depends, to a large extent, machine tool activities in the closing month of the year and early part of 1929.

Many local plants have sufficient unfilled orders to maintain current production schedules almost through the remainder of 1928. Deliveries on some types of tools cannot be made in less than eight to 10 weeks, although on the general run of equipment four to six weeks is nearer the average. Automobile makers in the Chicago district as well as in Detroit territory have bought new equipment. A Milwaukee company is expected to place an order for the manufacture of about 20 special machines.

In the railroad field local builders are bidding on the Norfolk & Western list, on four engine lathes for the Southern Pacific and two lathes for the Burlington. Several Cincinnati machine tool makers

report a fair volume of business from European countries in the last two months. While these sales in the aggregate constitute only a small part of total bookings, they are of large enough proportions to show that foreign users, especially those operating automobile factories, are interested in American high-production tools.

Ohio Valley Oxygen Co., 942 Kenyon Avenue, Cincinnati, has asked bids for a one-story addition, to cost \$35,000 with equipment. J. G. Steinkamp & Brother, Mercantile Library Building, are architects. F. R. Williamson is president.

G. R. Boeckling Motor Car Co., 1900 East Third Street, Dayton, Ohio, will take bids in November for new two-story service, repair and garage building, to cost approximately \$100,000 with equipment. Gebhardt & Schaeffer, Miami Savings & Trust Building, are architects.

Weinman Pump Mfg. Co., 276 Spruce Street, Columbus, Ohio, has awarded general contract to Middle States Construction Co., 1183 Essex Avenue, for a two-story building to cost about \$22,000.

Memphis Natural Gas Co., Memphis, Tenn., is disposing of bond issue of \$6,000,000, part of proceeds to be used for expansion, including construction of pipe line, 210 miles long, compressor stations and auxiliary work.

Air Corps, Material Division, Wright Field, Dayton, Ohio, will receive bids until Oct. 29 for tire pressure gages, vulcanizing knives, wrenches, and other tools, circular 153; until Nov. 5 for 1000 tow target assemblies, circular 160.

Board of Education, Covington, Ohio, is said to be considering installation of manual training equipment in new senior and junior high school to cost \$160,000. Marley Leyley, Tecumseh Building, Springfield, Ohio, is architect.

Milwaukee

MILWAUKEE, Oct. 22.—Machine-tool business continues in good volume. Only a shortage of skilled machinists and other shop labor is restricting further expansion of production and, in some instances, delay in getting deliveries of new equipment. Demand is broad and diversified, with the automotive industries in general the most active buyers.

Aluminum Goods Mfg. Co., Manitowoc, Wis., has started work on a seven-story addition, 115 x 302 ft., to main plant in Manitowoc. It will be used both for manufacturing and warehousing and will cost about \$600,000 complete. Plans are by W. Fred Dolke, Jr., architect, 9 South Clinton Street, Chicago.

Wisconsin Tool & Mfg. Co., 1219 Thirtieth Street, Milwaukee, specializing in production of heavy dies for automotive industry, is preparing to move into its new plant at Forty-fourth and State Streets, representing an investment of \$150,000 and affording 60,000 sq. ft., six times former area.

Waukesha Motor Co., Waukesha, Wis., has broken ground for second unit of a \$600,000 enlargement program. It will be two stories, 44 x 264 ft., and used as a shipping and storage building. A 3-ton crane has been purchased from Harnischfeger Corporation. A. W. Dietzel is plant engineer.

Plans are being completed by W. G. Kirchhoffer, consulting engineer, Madison, Wis., for a water softener plant for University of Wisconsin, Madison. Equipment will include two 2,000,000-gal.

pumping units, one steam turbine, several motors, chemical feeder, power mixer, etc. Bids for building and equipment will be taken shortly by J. D. Phillips, business manager, Board of Regents, Madison.

Wisconsin Power & Light Co., Madison, Wis., has placed contract with S. Morgan Smith, 33 South Clark Street, Chicago, for two waterwheels for a \$150,000 hydro-electric generating plant improvement of its subsidiary, Rockton Light & Power Co., Rockton, Ill. Generators and other equipment remain to be purchased. Mead & Seastone, Madison, are consulting engineers, and E. J. Kallevang is chief engineer.

Wisconsin Radiator & Body Co., 570 National Avenue, is starting work on an addition to cost \$25,000 complete. Meredith Brothers Co., 253 Washington Street, local, is general contractor.

Nash Motors Co., Kenosha, Wis., has let complete contract to Worden-Allen Co., Chicago, for a new forge shop and heat treating plant, 160 x 190 ft., at Racine. In connection with power plant improvements for this division, Charles A. Cahill & Sons, 214 Mason Street, Milwaukee, consulting engineers, are taking bids on two 150-ft. steel stacks, 78 in. diameter. David M. Averill is general manager at Racine.

Sivyer Steel Casting Co., Milwaukee, is completing work on a one-story foundry addition, 48 x 52 ft., and a new power house, 70 ft. sq., at West Milwaukee.

Detroit

DETROIT, Oct. 22.—Campbell, Wyant & Cannon Foundry Co., Muskegon Heights, Mich., manufacturer of iron castings, is planning expansion program to cost more than \$500,000, to include new foundry units and additional equipment.

Heywood Starter Co., 6547 St. Paul Street, Detroit, manufacturer of starting equipment for aircraft motors, is disposing of a stock issue to total \$187,500, the majority of proceeds to be used for expansion. Edward Hughes is general manager.

Chrysler Corporation, Detroit, is having plans drawn for one-story addition to plant on East Jefferson Avenue, for enameling to cost over \$85,000; also for a five-story addition to same plant for general service to cost more than \$130,000. Smith, Hinchman & Grylls, Marquette Building, are architects. For its Dodge Brothers Division, company plans one-story assembling unit, 120 x 190 ft., to cost more than \$750,000 with equipment.

Edward Sterner Co., Flint, Mich., plumbing equipment and supplies, is said to be planning to rebuild portion of storage, distributing, pipe fitting and mechanical plant recently destroyed by fire.

Board of Education, Pontiac, Mich., plans installation of manual training equipment in new Washington junior high school to cost \$475,000, for which bids have been asked on general contract. Malcolmson & Higginbotham, 1219 Griswold Street, Detroit, are architects.

National Stamping Co., 617 Glover Avenue, Detroit, has awarded general contract to W. J. C. Kaufmann, 10610 Shoemaker Street, for one-story addition for enameling, to cost more than \$40,000.

Lincoln Mfg. Co., 2630 Erskine Street, Detroit, manufacturer of electrical equipment and supplies, has awarded general contract to Lerner-Sobel Co., Book Build-

ing, for four-story plant, 86 x 100 ft., to cost about \$100,000 with equipment.

McManus Steel & Iron Co., Detroit, recently formed with capital of \$500,000, will take over and succeed to plant and business of Buhl Malleable Co., 3290 Wight Street. New company is disposing of 50,000 shares of common stock to provide funds for purchase and expansion. Patrick J. McManus, formerly connected with Buhl company, is president and general manager of the new organization.

Muskegon Piston Ring Co., Sixth and Alpha Streets, Muskegon, Mich., will soon take bids for one-story addition, to cost more than \$25,000 with equipment. Frank Forster, Lyman Block, is architect.

Holcroft & Co., 6545 Epworth Boulevard, Detroit, manufacturers of furnaces, ovens, etc., have plans for one and two-story addition, 105 x 180 ft., to cost more than \$100,000 with equipment. C. L. Phelps, Detroit Savings Bank Building, is architect.

Standard Self-Lock-Nut Co., Muskegon, Mich., has been formed to manufacture self-lock nut depending on frictional contraction for holding and gripping power. Andrew Wierengo, president Standard Malleable Iron Co., Muskegon, is president of new company. Plant is at Muskegon and company will manufacture product from malleable iron made by Standard company.

Allied Products Corporation, Detroit, has succeeded to business and properties of Victor-Peninsular Co., Detroit; Richard Brothers Die Works, Detroit and Hillsdale, Mich., and Indiana Lamp Corporation, Connersville, Ind. General offices of new concern will be at 4645 Lawton Avenue, at plant of Victor-Peninsular Co. R. O. Cunningham, formerly president Indiana Lamp Corporation, is president of new company, and former executives of various units will remain in charge of their respective plants.

Wise & Braisted, General Motors Building, Detroit, have been appointed district sales agents in Michigan for Roller-Smith Co., 233 Broadway, New York.

C. H. C. Co., 417½ Liberty Street, Jackson, Mich., has been formed to manufacture screw machine products and tools. Company is in operation and is in market for screw stock and tool steel. Work will be done by contract.

Harris-Beasley, Inc., 1304 Harper Avenue, Detroit, has been organized to do electroplating, specializing in chromium plating, polishing and buffing.

Indiana

INDIANAPOLIS, Oct. 22.—Contract has been let by Mid-States Steel & Wire Co., Crawfordsville, to Warner & Wirt, local, for one-story foundry, 85 x 245 ft., to cost about \$45,000 with equipment.

Chevrolet Automobile Sales, 345 North Capitol Avenue, Indianapolis, operated by Jones-Whitaker Sales Co., is having plans drawn for a two-story service, repair and sales building, to cost about \$100,000 with equipment.

Continuing its expansion program, Studebaker Corporation, South Bend, has awarded general contract to Ralph Solitt & Sons, 518 East Sample Street, for one-story addition, 62 x 300 ft., to cost about \$80,000. Lockhart & Fett, Associates Building, are architects. Plans are also being drawn by same architects for a two-story building, 90 x 200 ft., to cost about \$50,000.

Department of Health, Indianapolis, is having plans drawn for new power house at city hospital, to cost more than \$350,000 with equipment. R. Frost Daggett, Continental Bank Building, is architect; C. R. Ammerman, same address, is consulting engineer.

City Council, Evansville, has plans for municipal airport on Princeton Highway, including hangars, machine and repair shop, oil storage and other units, to cost \$175,000. B. Russell Shaw, Arcade Building, St. Louis, is engineer.

Louisville Pipe Organ Co., 1615 North Thirteenth Street, Terre Haute, Ind., has been organized to manufacture pipe organs. Residence and mortuary organs are equipped with automatic reproducing rill attachment. Contracts for equipment have been let and plant is in operation.

Diamond Chain & Mfg. Co., Indianapolis, has completed arrangements with I. H. Dexter Co., Goshen, N. Y., to manufacture Clark flexible coupling, made and sold by Dexter company for 15 years. Couplings are made in sizes for slow or high speeds and continuous or reciprocating drives. Diamond company has awarded general contract to Hall Construction Co., Board of Trade Building, for two additions, four stories, 60 x 160 ft., and one story, 40 x 100 ft., to cost over \$125,000 with equipment. Bishop, Knowlton & Carson, 312 North Meridian Street, are architects.

Pacific Coast

SAN FRANCISCO, Oct. 18.—Santa Maria Airlines, Inc., Santa Maria, Cal., has plans for two new hangars and one-story machine shop to cost more than \$75,000.

City Council, Turlock, Cal., will receive bids until Nov. 4 for four motor-driven pumping plants, including pumping units and accessories. A. P. Ferguson is city clerk.

Great Western Power Co., 530 Bush Street, San Francisco, has asked sub-bids for all portions of work for new steam-operated electric generating plant, one story, 150 x 180 ft., to cost more than \$3,000,000 with equipment. Harold K. Fox is chief engineer; McClellan & Junkersfeld, 68 Trinity Place, New York, are consulting engineers.

Majestic Furnace & Mfg. Co., 1723 Westlake Avenue, North, Seattle, has purchased additional property and is considering new one-story unit, 95 x 290 ft., to cost about \$60,000.

Coal Carbonizers, Inc., Centralia, Wash., recently organized, has acquired plant and business of Mendota Coal & Coke Co., Mendota, B. H. Johnston, president, and is said to be planning construction of new coal carbonizing and reduction plant to cost more than \$400,000 with equipment.

Joseph Kreutzer, 1801 South Hope Street, Los Angeles, and associates have engaged Austin Co. of California, Inc., 777 East Washington Street, to prepare plans for airport near Culver City, consisting of four hangars, aircraft factory for parts and assembling, experimental building and school, two machine and repair shops and other units, to cost about \$280,000.

Southern California Edison Co., Los Angeles, has approved plans for one-story mechanical shop and testing works near Visalia, Cal., with one-story equipment storage and distributing plant, 61 x 220 ft., steel tank of 75,000-gal. capacity on 100-ft. steel tower and other structures, to cost about \$250,000.

Idaho Portland Cement Co., Pocatello, Idaho, E. J. Simons, president, is contemplating new mill at Inkom, Idaho, to cost more than \$600,000 with machinery.

Union Oil Co., Grant and Kentucky Streets, Bellingham, Wash., will soon begin construction of oil storage and distributing plant to cost \$125,000 with equipment.

Canada

TORONTO, Oct. 22.—Machine tool business continues in good volume and inquiries indicate a steady demand for some time to come. Although buying is well distributed and covers many lines of manufacture, the automotive industry is the principal purchaser at the moment. The Steel Co. of Canada, Ltd., Hamilton, is expected to come into the market soon for considerable equipment for its proposed \$6,000,000 plant addition and has already placed orders for several cranes. The Algoma Steel Corporation, Sault Ste. Marie, Ont., and the Dominion Iron & Steel Co., Sydney, N. S., have been buying recently. The railroads have also taken car shop equipment and have small lists out for replacement tools.

Durant Motors of Canada, Ltd., Toronto, has purchased site with 750 ft. frontage on Laird Drive, Leaside, and will erect a plant building to cost \$75,000.

General Motors of Canada, Ltd., Oshawa, Ont., will double capacity of its stamping plant by an addition 105 x 400 ft., to cost with equipment \$80,000. Contract has been awarded to Gay Co., Oshawa. Other additions are under way.

Enamel & Heating Products, Ltd., will make extensions and alterations to its plants at Sackville and Amherst, N. S. Work will be started immediately on a one-story building at Sackville, 50 x 100 ft. At Amherst facilities for handling enameling requirements of company will be increased. Stove manufacturing will be concentrated at Sackville and building at Amherst where a few stoves are now manufactured will be turned into a wet process enameling plant. An electrically-driven compressor will be installed and arrangements are being made to start another oven.

W. H. Cooper, 6 Hughson Street North, Hamilton, Ont., has been awarded general contract for two-story addition, 60 x 120 ft., to plant of Wallace Barnes Co., Ltd., Hamilton, manufacturer of steel wire springs, etc.

Frankel Salvage Co., Ltd., Eastern Avenue, Toronto, has been awarded contract for one-story addition, 140 x 170 ft., for A. R. Williams Machinery Co., Ltd., 64 Front Street West, Toronto.

Pannill Door Co., Toronto, will establish a manufacturing plant at Frederick and Front Streets, and will require wood-working machinery and tools.

Walter G. Hunt & Co., Ltd., 1405 Bishop Street, has been awarded general contract for an addition to forge foundry for Canadian Tube & Steel Products, Ltd., 107 Hamilton Street, Ville Emard, Que., to cost \$10,000.

Wood Hydraulic Hoist & Body Co., 1025 Tecumseh Road, Windsor, Ont., has awarded contract to the Reynolds Wood Co., for a one-story addition, 80 x 85 ft., to cost \$25,000.

MacLaren Firm, Ltd., Birmingham, Que., has awarded general contract to William I. Bishop, Ltd., 10 Cathcart Street, Montreal, for a power plant, on the Lievre River, to cost \$15,000,000.

R. D. Ferguson, New York, is engineer. Work will also include erection of a 250-ton paper mill, sulphite mill, etc.

Great Lakes Power Co., Ltd., 527 Queen Street East, Sault Ste. Marie, Ont., has awarded contract to Lang & Ross, 623 Queen Street East, for a power plant in connection with its \$1,000,000 power development project near Sault Ste. Marie.

Western Canada

City Council, Nelson, B. C., has awarded contract to Stuart Cameron & Co., 543 Granville Street, Vancouver, B. C., for construction of a hydroelectric plant, including reinforced concrete power house and water storage dam, to cost approximately \$150,000. R. C. Affleck is engineer.

Clayburn Co., Ltd., 850 Hastings Street, Vancouver, B. C., will start work soon on a manufacturing plant at Kilgard near Abbotsford, B. C., to cost \$300,000.

Plant of Dominion Rubber System (Manitoba), Ltd., Princess Street, Winnipeg, was destroyed by fire Oct. 14.

Foreign

ABOUT 80 per cent of tractor plant of Ford Motor Co., Detroit, will be removed from Fordson, Mich., to Cork, Ireland, where production will be largely concentrated in future, owing to increased demand from European countries. Cork plant will be developed for larger output. It is expected to have removal completed early in coming year. Tractor production was discontinued at Fordson works several months ago and while this branch will not be permanently abandoned in United States, all space at Fordson will be given over for some time to manufacture of Ford automobiles.

Department of Public Works, State of Rio Grande do Sul, Brazil, is planning early call for bids for construction and installation of a number of hydroelectric power plants for light and power to different municipalities. It is also proposed to electrify railroad between Santa Maria and Porto Alegre, about 250 miles.

Soviet Russian Government, Leningrad, through Amtorg Trading Corporation, 165 Broadway, New York, its official buying agency, has contracted with International General Electric Co., 120 Broadway, for electrical machinery and supplies for a six-year period, in total amount from \$21,000,000 to \$26,000,000 in that time, including equipment for hydroelectric power development, power substations, transmission and distributing lines, and other operating service. During first two years purchases are to aggregate not less than \$5,000,000 nor more than \$10,000,000, and succeeding four years not less than \$4,000,000 per annum.

Port Commission, Genoa, Italy, has authorized extensions and improvements to include construction of large storage and distributing warehouse, with mechanical handling equipment, including 14 lifting cranes, estimated to cost \$212,000.

Andes Copper Mining Co., 25 Broadway, New York, operating porphyritic copper ore properties in Province of Atacama, Chile, has disposed of a block of stock, a portion of proceeds to be used in connection with development and expansion of mines, including installation of equipment. Company is a subsidiary of Anaconda Copper Mining Co.

Tagil Mills, Leningrad, Russia, have fund of \$1,000,000 for extensions and improvements in sheet iron works, to include installation of rolling machinery, manufacture of roofing and other products, to cost approximately one-half of sum noted.

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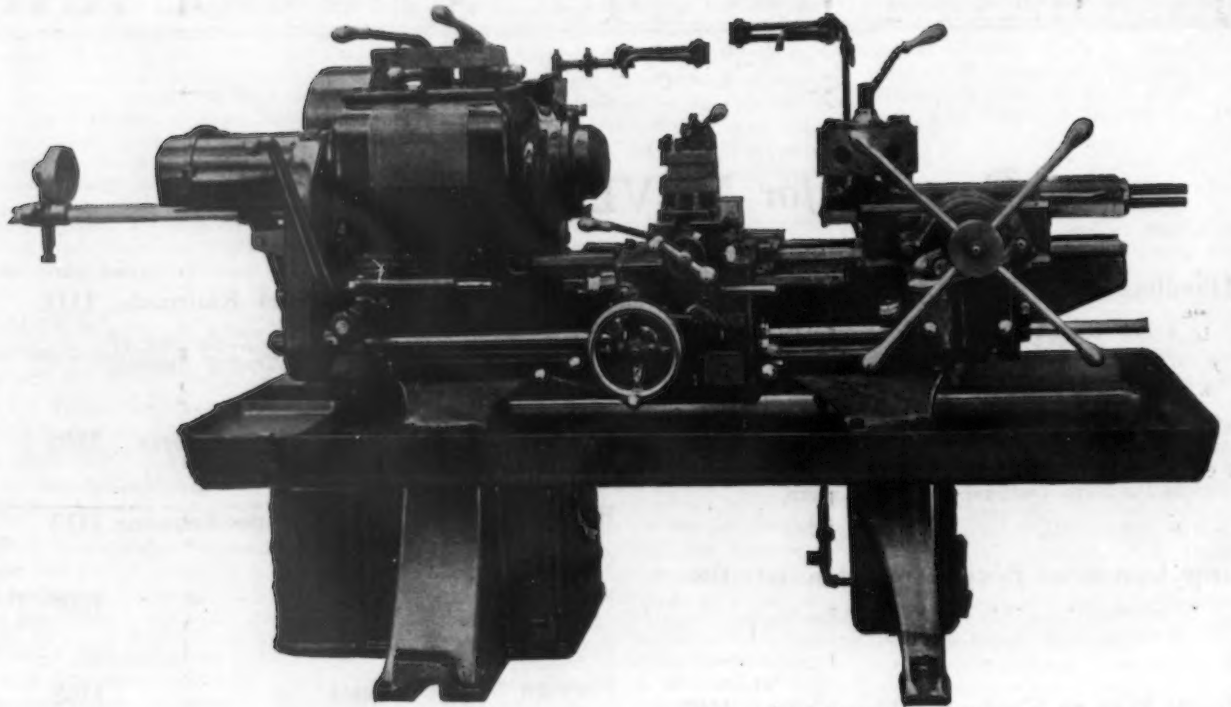
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